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Hamadoun Touré hands ITU leadership to Houlin Zhao: GTB interviews both

Plus

Who are the 50 CMOs to watch in telecoms? GTB report
Telefónica's Enrique Blanco on virtualisation plans for 2015
AT&T's CMO, Cathy Coughlin: moving to digital-first strategy

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Global Telecoms Business for the industry's CFOs

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**50 CFOs TO WATCH
2015**

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CFO SUMMIT 2015

Who will be the CFOs in the hot financial seats in our industry next year?

We on Global Telecoms Business have been publishing an annual guide to the 50 CFOs to watch for the past few years.

We're now looking for the 50 CFOs of telecoms service providers to watch for 2015. We want your help in identifying them.

Publication

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Deadline for nominations

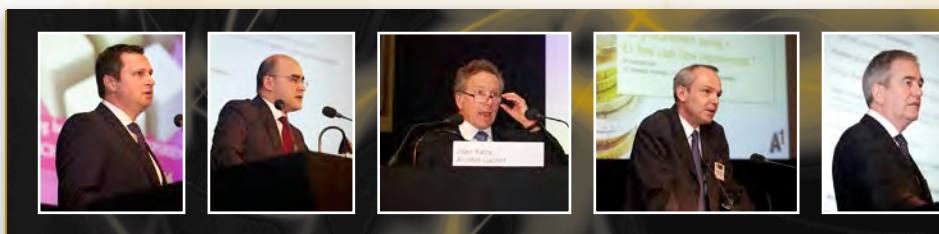
Monday 1 December 2014

How to nominate

Send an email to the editor, Alan Burkitt-Gray, at aburkitt@euromoneyplc.com. To help us track and follow up nominations please start the email subject line with 'CFO to watch' and the person's name



GTB CFO Summit



CFOs are telling us that they, and the telecoms industry, are facing a new set of challenges

- What sustainable revenue streams can operators continue to rely on and what new revenues can they develop?
- What costs can operators continue to take out from their networks to become still more competitive?
- What are the sources of finance for building the fast fixed and mobile broadband networks that we need?
- How can operators continue to be an attractive proposition for shareholders, banks, private equity and other investors?

The next GTB CFO Summit will bring together carrier CFOs to explore the

issues they have raised and look for answers. Delegates attending the Summit will be able to gain a great deal of important market intelligence from the speakers and the panels. The GTB CFO Summit offers excellent networking opportunities because there will be a major concentration of CFOs in one place.

This will be the third annual GTB CFO summit and we're already booking speakers — industry leaders such as Joe Euteneuer, the CFO of Sprint, is one of the first to agree to take part.

The event will be in London on **Tuesday 24-Wednesday 25 March 2015**. We'll be announcing the full exciting agenda and details of the venue later this year — but put the dates in your diary now!

AT&T buys Iusacell for \$2.5bn, Televisa sells share at loss

AT&T has agreed to buy Grupo Iusacell from billionaire Ricardo Salinas for \$2.5 billion, reports Bloomberg.

AT&T will gain 8.6 million subscribers with the purchase of closely held Iusacell, the third-largest wireless operator in Mexico. Iusacell has struggled to compete against Carlos Slim's América Móvil. The price includes \$800 million in debt. The acquisition will take place after Salinas closes a deal to buy the 50% of Iusacell owned by Grupo Televisa.

Televisa agreed to sell its 50% stake in Iusacell to Salinas for \$717 million last month, taking a loss on the operator that has struggled for years to compete against industry giant América Móvil. Televisa agreed in 2011 to pay \$1.6 billion for a 50% stake in Iusacell, a deal that took a year to gain regulatory approval.

Grupo Televisa has reported a third-quarter loss after booking a one-time charge for exiting its

investment in Iusacell, reports Bloomberg. The net loss of 182.8 million pesos (\$13.5 million) compares with net income of 2.39 billion pesos a year earlier. The company said it would miss its full-year revenue forecast for its TV programming business after Mexican lawmakers placed limits on junk-food advertising.

"While the Iusacell deal was painful, it doesn't mean Televisa is finished with the wireless market," executive vice president Alfonso de Angoitia said in a conference call with analysts. "The company is looking at ways to get involved the industry without requiring as much capital," he added.

AT&T is expanding into Mexico after agreeing earlier this year to pay \$48.5 billion for DirecTV, which provides satellite-TV service in the US and Latin America. Four months ago, Mexican president Enrique Peña Nieto signed a telecoms



Randall Stephenson: Reforms make Mexico an attractive place to invest

overhaul into law that promotes competition and reinforces oversight of the industry.

"Our acquisition of Iusacell is a direct result of the reforms put in place by President Peña Nieto to encourage more competition and more investment in Mexico," AT&T chief executive Randall Stephenson said. "Those reforms together with the country's strong economic outlook, growing population and growing middle class make Mexico an attractive place to invest."

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Telecom Italia may invest \$950m in Brazil, awaits approval of Telecom Argentina sale

Telecom Italia is considering investing an extra €750 million (\$947.4 million) in its Brazilian unit TIM Participacoes, reports Reuters. The investment programme — called Turbo by the operator — will be put to the TIM Brasil board for approval.

Telecom Italia lost out to Telefónica in a multi-billion dollar battle to buy Brazilian broadband operator GVT from French group Vivendi, leaving TIM Brasil in a considerably weaker position than its rivals in terms of fixed line infrastructure, Telegeography reports.

Telecom Italia's Plan B has seen it hire Banco Bradesco's investment banking unit to analyse a potential bid for rival Oi, which boasts considerable fixed line assets, but remains slightly adrift of the three leading mobile operators: Vivo, TIM Participacoes and Claro.

Chief executive Marco Patuano has said the company's Brazilian mobile operator, TIM Participacoes isn't for sale, and the unit is focusing on organic growth, reports The Wall Street Journal.

Unlike its rivals in Brazil that also sell broadband and pay-TV services, TIM Participacoes is a mobile only operator. Oi, which has the smallest market share of Brazil's four mobile operators, said in August it is considering possible acquisitions in the country, including TIM.

Patuano nevertheless left the door open for potential purchase offers. "TIM isn't for sale, but we could study any offer depending on the price," he said.

Brazil's telecoms industry is going through an upheaval and Telefónica, TIM and América Móvil are all studying options to buy, sell or merge assets.

Demand in Brazil for mobile services is growing strongly, and TIM has long-term plans for its business there, Patuano said. "We're not worried about short-term volatility," he added.

Telecom Italia has said that any attempt force it to spin off its domestic fixed-line phone network

would be illegal, reports Reuters. Some local politicians have revived the idea in a bid to speed up broadband investment in the country.



Marco Patuano: TIM Participacoes is not for sale but we could study any offer

The former monopoly has been criticised for putting off costly upgrades to its copper network and politicians have been calling for a transfer of the business to a state-controlled entity since 2006.

Under pressure from the previous government and in the face of a takeover approach by Hutchison Whampoa, Telecom Italia started talks with Italy's Cassa Depositi e Prestiti (CDP) last year to spin off the network and sell a stake in it to the state-backed lender.

But disagreements over who would occupy top management positions at the new network company and uncertainty over regulation and the value of the business halted the discussions.

The operator's core shareholders led by Telefónica are exiting their seven-year investment, making the phone company a possible takeover target.

Telecom Italia said the network spin-off idea was legally groundless and not part of its business plan, which instead envisages the sale of its Argentine division and other asset disposals to help to fund investments and cut debt of €27 billion (\$34.6 billion).

Telecom Italia is to sell only part of its majority stake in

Telecom Argentina and the remainder once SECOM, the Argentine regulator, approves its full sale to investment fund Fintech, reports Reuters.

The Italian operator had agreed to sell its controlling stake in Telecom Argentina holding company Sofora to Fintech for \$960 million almost one year ago, but SECOM has been slow to approve the deal.

Telecom Italia has said it expects SECOM's approval within two and a half years, and that in the meantime it would sell an initial 17% in Sofora to Fintech by the end of October for \$216 million.

The operator then plans to sell its remaining 51% controlling stake in Sofora to Fintech once regulators give approval. The sale of Telecom Argentina was part of a €4 billion (\$5 billion) plan created last year by Patuano to help cut debt and fund much-needed investment to keep up with competitors in its two key Italian and Brazilian markets.

One issue seen as preventing regulatory clearance is Fintech's 40% stake in Cablevision, Argentina's biggest cable television company, as local regulations limit cross holdings between telecoms and media firms.

América Móvil seeks \$17.5bn for Mexico assets but buyer must prove independence

América Móvil has contacted potential suitors including AT&T and SoftBank as it prepares to sell assets along the east coast of Mexico in order to comply with new regulation that penalises operators for market dominance in Mexico, reports Bloomberg.

The company is also pitching the sale to Bell Canada and China Mobile. The sale will include América Móvil's infrastructure in a strip of states from north to south along Mexico's eastern coast.

The assets could be valued at five to seven times earnings before interest, taxes, depreciation and amortisation of \$2.5 billion, implying a value of as much as \$17.5 billion. América Móvil hasn't yet asked for bids because the preliminary information, or teasers, didn't provide enough details for a company to make an offer, two people said.

América Móvil, which is controlled by billionaire Carlos Slim Helu, is selling assets in its largest market to appease regulators as antitrust penalties curb profit. The Mexico City-based operator, which has 70% of the local wireless market and 80% of landlines, may get penalties revoked if it cuts market share below 50%.

Chief executive Daniel Hajj has said that asset sales should

foster greater competition in Mexico, satisfying regulators' requirements. He said the company is also planning a spin-off of wireless towers, without providing details on the timing.

América Móvil is trying to sell assets from Mexico's west coast and the border with the United States, not just the east coast, as part of the previously announced divestiture, reports Reuters.

When asked if the company was negotiating with AT&T over the sale, Slim declined to comment. AT&T through its planned acquisition of DirecTV is set to compete with América Móvil in the Mexican market. The two operators have previously co-operated.

Slim said after the sale announcement in July that it would be a "transversal" cut of the company.

Companies looking to acquire América Móvil's assets in Mexico will have to prove they are completely independent, according to the president of the country's telecoms regulator, reports Bloomberg.

Historical relationships and personal ties will also need to be examined, said the official, Gabriel Contreras. That may potentially put pressure on AT&T which América Móvil has contacted



Carlos Slim Helu: Sales will create a transversal cut of the operator

about buying parts of its Mexican mobile and landline units.

The operator announced its breakup plan because of new laws designed to create competition in a market it has dominated. Less than two months earlier, AT&T had cut off its financial links to América Móvil to help clear the way for the acquisition of DirecTV, a direct competitor to Slim's company across Latin America. To break ties, AT&T sold its stake in América Móvil after 24 years.

"Whether there's been history or not, of course, is something we have to study," Contreras, president of the Federal Telecommunications Institute, known as IFT, said. The agency, which has to approve any deal, would seek "to verify if it's something that subsists or not, apart from whether there have been any corporate or capital changes."

Vodafone and Telecom Italia target Metroweb stake

Vodafone is considering buying a stake in fibre optic operator Metroweb to compete with Telecom Italia in high-speed broadband services, reports Bloomberg.

A potential seller could be investor F2i SGR, which owns 54% of Metroweb Italia. Metroweb Italia in turn controls 87% of Metroweb SpA.

Another potential acquirer is Telecom Italia, whose chief executive Marco Patuano obtained a mandate from his board in September to make an offer for Metroweb. Italy's largest

operator is interested in taking a controlling stake in Metroweb and this holding may be valued at about €300 million (\$375 million).

A purchase of Metroweb, which operates a network in the Milan area, would allow an acquirer to strengthen its broadband service.

Some analysts have valued Metroweb at around €400 million but both Telecom Italia and F2i have declined to comment on a deal.

Buying a stake in Metroweb would allow Telecom Italia to join forces with cash-rich state

lender Cassa Depositi e Prestiti (CDP), which indirectly controls Metroweb with F2i.

The acquisition of F2i's stake would allow Telecom Italia to increase its fibre optic reach, attract new clients and help avoid duplication in costly investments at a time when it is battling to cut debt of almost €27 billion.

Patuano said the operator planned to continue with the sale of its Italian mobile towers in order to invest resources in the broadband network. Italy has one of the lowest penetration rates for broadband in Europe.

Altice and VC firms seeks to buy Oi's Portuguese assets

Patrick Drahi's cable and telecoms company Altice is looking to acquire the Portuguese assets of Brazilian operator Oi, reports Reuters.

Facing growing competition in the Brazilian market from foreign rivals, Oi announced plans in October 2013 to merge with Portugal Telecom. Portugal Telecom has already transferred its local assets to Oi and retains a minority stake in the enlarged business.

Altice has been looking for acquisitions to increase its presence in Europe. In April, Altice-controlled French cable firm Numericable agreed to buy France's second largest mobile operator SFR from Vivendi.

Drahi has said that his group's strategy was to look at acquisition targets in countries where it was already present, such as Portugal and Belgium.

Oi chief executive Zeinal Bava has stepped down, potentially paving the way for a breakup of the indebted Brazilian operator's year-old merger with Portugal Telecom, reports Bloomberg.

Bava, the former Portugal Telecom chief executive who joined Oi last year to facilitate the trans-Atlantic combination, resigned with immediate effect. Chief financial officer Bayard Gontijo will take over until the board nominates a successor.

Bava is leaving less than three months after Portugal Telecom was forced to absorb €897 million (\$1.1 billion) in debt from a unit of Espirito Santo International.

"Bava leaving removes the main driver behind the merger between the Portuguese and Brazilian assets," said Alexandre Iatrides, an analyst at Oddo & Cie. in Paris. "Selling the Portuguese assets may be a good way for Oi to enable a strategic move in Brazil."



Altice, the owner of French cable operator Numericable, is targeting Oi's Portuguese assets

In August, Oi hired Banco BTG Pactual to study the possibility of buying Telecom Italia's stake in its Brazilian wireless unit, TIM Participacoes. However, TIM is working with Bradesco to negotiate an acquisition of Oi, according to Bloomberg sources.

Altice has made a €7 billion (\$8.8 billion) offer to buy Oi's Portuguese telecoms assets, reports Bloomberg. Altice will finance the bid with cash and debt, and the purchase price includes €800 million that will depend on Portugal Telecom's future revenue and cash flow, Luxembourg-based Altice said.

Other potential bidders also include CVC Capital Partners, Apax Partners and Bain Capital Partners. Apax Partners is planning to offer about €7 billion (\$8.8 billion) for Oi's assets in Portugal in partnership with Bain Capital Partners and at least one other fund, reports Bloomberg.

The private-equity funds are looking at the company's financial numbers in detail, aiming to match a proposal made by Drahi. The funds are betting the Portuguese government would be in favour of their offer. The firms are considering raising debt to help finance the transaction.

Oi has already rejected the

terms set in a takeover offer for a Lisbon-listed holding company in which it holds a 10% stake, amid concerns that it may complicate its plans to grow in Brazil, reports

The Wall Street Journal.

Oi said a €1.2 billion (\$1.5 billion) offer for Portugal Telecom includes unacceptable terms. The

offer was presented

by Terra Peregrin, a firm controlled by Isabel Dos Santos, the daughter of Angola's president and Africa's wealthiest woman.

Terra Peregrin is offering to pay €1.35 per share of Portugal Telecom on the condition that it secures more than 50% of the company's shares. The offer for Portugal Telecom is part of a complex operation spanning the telecoms industries in Brazil and Portugal.

MTN and Vodacom are considering acquiring a stake in Oi's African businesses, reports Bloomberg.

The operators are interested in acquiring a minority stake in Unitel, Angola's largest mobile operator, which is part of Africatel Holdings, the holding company that Oi put up for sale last month. Oi owns 75% of Africatel, which is valued at about 5 billion reais (\$2.1 billion).

MTN and Vodacom have been looking for acquisition opportunities in countries with low rates of wireless use, high economic output and large populations. A sale of its African assets would give Oi proceeds it can use to explore the acquisition of a local rival as the operator struggles with a debt load of 46.2 billion reais.

Oi has been working on a sale of its stake in Africatel after acquiring it earlier this year as part of its merger with Portugal Telecom.

Ericsson to cut costs by \$1.2bn, Alcatel-Lucent losses narrow, HP to split

Ericsson plans to reduce its costs by 9 billion Swedish kronor (\$1.2 billion) with a programme that includes reductions in employee numbers to boost profit, reports Bloomberg.

The savings are targeted to take full effect in 2017 and measures will include an unspecified number of job cuts and savings in external costs. Ericsson, led by chief executive Hans Vestberg, had 117,508 employees at the end of September 2014.

The programme marks a return to job reductions for the network maker as rivals Nokia and Huawei are outpacing it in sales growth while the market for network equipment faces a prolonged period of slow expansion. Demand for wireless network equipment is set to grow an average of 2-4% a year until 2017, Ericsson has projected.

About 40% of the world's mobile calls and data are carried through Ericsson's networks, which the manufacturer sells to operators such as AT&T and Vodafone. In addition to seeking savings, Ericsson is focusing on services, cloud computing and software.

Alcatel-Lucent has achieved a narrower third-quarter loss as chief executive Michel Combes continues to cut costs to offset falling sales, Bloomberg reports.

The loss excluding some items narrowed to €9 million (\$11.3 million) from €186 million a year earlier. The gross margin, a



Jean Raby: Focus is on profitable contracts

measure of profitability, widened to 34%, beating the 32% analysts predicted on average.

Combes has sought to focus on more profitable contracts while cutting jobs and selling assets to revive Alcatel-Lucent. Persuading customers to spend more on network equipment has proven more difficult, as operators cope with falling earnings in Europe and pause in the U.S. after building higher-speed infrastructure.

"We improved profitability in most of our business lines," chief financial officer Jean Raby said. "It's thanks to a better mix, better products and a focus on profitable contracts."

Alcatel-Lucent said it has now achieved savings of €645 million, two-thirds of what it targets with its cost-reduction effort. Its adjusted operating margin widened to 5.2% from 3.2%.

HP chief executive Meg

Whitman is adopting a plan to split the company's PC and printer divisions off from its enterprise hardware and service groups, reports Bloomberg. She rejected a split as recently as last year, saying more time was needed to restore the company's stature as the innovator that put Silicon Valley on the map.

"If you try to hived a division off, it's really hard because you almost have to recreate the whole thing," Whitman told Bloomberg News in 2011.

Even though she has rejected a split-up of Hewlett-Packard before, Whitman is no stranger to reinventions. Before running HP, she pursued a career in politics and made an unsuccessful run at becoming California's governor. Before that, she ran Ebay for a decade.

HP now plans to split into two separate companies, a personal-computer and printer business, and corporate hardware and services operations.

Whitman will lead Hewlett-Packard Enterprise, a business focused on corporate hardware and services, while Dion Weisler, the vice president in charge of Hewlett-Packard's personal computer and printer operations, will become chief executive of that business.

Whitman has been introducing new products and has expanded a job-cut programme to more than 55,000 jobs to trim costs.

CWC to buy Columbus International for \$1.85 bn

Cable & Wireless Communications is to acquire Columbus International, a privately-owned fibre-based operator in the Caribbean, Central America and Andean region, for \$1.85 billion, reports Reuters.

CWC, which said the agreed deal would extend its presence in the region, said it would place new shares of nearly 10% of its capital to help buy the company, which is backed by cable TV billionaire John Malone.

Phil Bentley, CWC's chief



Phil Bentley: Plans to create best in class quad-play offering

executive, said buying Columbus would accelerate growth and

increase returns. "Together, we will create the best-in-class quad-play offering in the region, delivered on a superior mobile, fibre and subsea network," he said.

Columbus, which has about 700,000 residential customers, provides triple-play cable TV, telephony and broadband over its own fibre optic network in the Caribbean. It also provides backhaul connectivity to 42 countries in the region, as well as capacity and IT services, corporate data solutions and data centre services.



Baksaas: eliminate potential conflict of interest

Jon Fredrik Baksaas, president and CEO of **Telenor**, has stepped down from the supervisory board of **VimpelCom**, in which Telenor holds a minority position of 33% and voting rights of 43%. Telenor said the reasons were that VimpelCom “finds itself under investigations related to its entry to the Uzbekistan market”. The company said that “corruption allegations and speculations are serious and Telenor as a minority owner will continue to take necessary actions to protect its interests”.

By stepping down from the supervisory board of VimpelCom, Baksaas “will eliminate any potential conflict of interest”, said Telenor. He will second his vote to **Kjell Morten Johnsen**.

Telenor has appointed **Rajeev Sethi** as CEO of its **Grameenphone** operation in Bangladesh and **Vivek Sood**



Vivek Sood: new CEO of Uninor

as CEO of **Uninor** in India. Sethi was previously CEO of Uninor; Sood had been CEO of Grameenphone since January 2013 and is returning to Uninor, where he replaces **Morten Karlsen Sørby**, who has stepped down so that he can return to Sweden, due to illness in his immediate family. The new CMO of Uninor is **Upanga Dutta**.

Inmarsat executive chairman **Andrew Sukawaty** is joining private equity firm **Warburg Pincus** as an executive-in-residence, based in London. Sukawaty will support the firm in the identification and evaluation of new investments in the telecommunications, media and technology sector. He will become non-executive chairman of Inmarsat from January 2015.

Eircom has confirmed that former CFO **Richard Moat** will be its new CEO. He was appointed acting CEO following the resignation of Herb Hribar in September 2014. Moat is a previous managing director of T-Mobile UK and was later CFO of Everything Everywhere — now EE.

Millicom has announced that **Hans-Holger Albrecht** will step down as president and CEO at the end of 2014. Company chairman Cristina Stenbeck has formed a committee to select a new CEO. Until then CFO **Tim Pennington** will be interim CEO.

Orange has appointed **Giorgio Heiman** as vice president of Africa for Orange Business Services. He takes over from **Jean-Luc Lasnier**, who is retiring. Heiman has been with Orange since 2004 and was previously at CERN, the European research organisation.

The board of **Mobily** in Saudi Arabia suspended its managing director and CEO, **Khalid Omar Al Kaf**, until the audit committee completes its task of reviewing what led to the restatement of the Q3 2014 financial results and submits its report to the board of directors. Etisalat — which owns

Mobily — said it is “following closely the issues related to the restatement” and is supporting Mobily’s board.

Nikesh Arora has joined **Sprint’s** board of directors, bringing the total number of board members to nine. Arora has been chief executive officer of **SoftBank** Internet and Media and vice chairman of SoftBank Corporation since October 2014.

Arora was chief business officer and senior vice president of Google until August 2014. He has also served as the CMO and a member of the management board of T-Mobile Europe.

Sprint has also appointed SoftBank executive **Junichi**



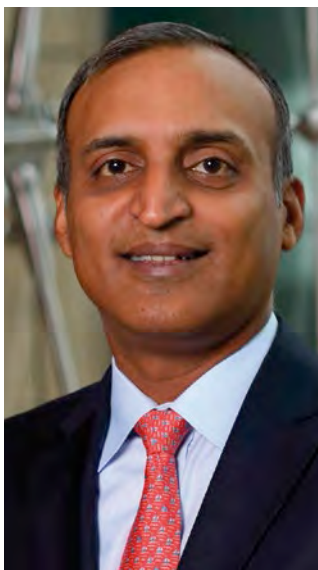
Moat: CFO to acting CEO to CEO

Miyakawa as technical chief operating officer. He joins from the SoftBank group, where he led the company’s network operations. Sprint CTO Stephen Bye and chief network officer John Saw retain their positions and will now report to Miyakawa.

UK operator **TalkTalk** has appointed **Iain Torrens** as CFO, following the departure of **Steve Makin**. Torrens was group finance director of ICAP, a voice and electronic dealer broker and provider of post trade risk services.

Donald Pels, one of the earliest investors in mobile phone networks in the US, has died at the age of 86. Later in life he helped start the High Line park project in New York.

Introduction



Bhaskar Gorti

Change in the communications industry has been a constant since Bell made that rather perfunctory call to his colleague Mr Watson in 1876.

However, today we are arguably at the heart of the largest and most complex change ever, as our services become the digital lifeblood for every commercial industry and public service across the world.

How service providers reinvent themselves for this digital world will drive our success, but also fundamentally change the health, wealth and happiness of our customers and fellow citizens across the world.

The chief marketing officer within a service provider has always been critical in understanding the services they provide and then communicating it with power and differentiation.

In the digital world, and the transformation required to thrive, this role becomes even more critical as services evolve to be complex, interdependent facets of an increasingly digital-enabled lifestyle.

CMOs like those highlighted in this report are taking that central role in their organisations. They understand where we have come from, but also where we need to go, and are positioned to drive change.

I applaud them for the impact they have already had and look forward to working with them, and within this industry, to enable the digital world of the future.

Bhaskar Gorti

Senior Vice President and General Manager
Oracle Communications



This is the first time Global Telecoms Business has attempted to identify the industry's 50 chief marketing officers to watch.

The reason for this innovation is simple: over the past few years more and more executives — in both operators and vendors — have been telling us that CMOs have become increasingly important in determining companies' strategy.

They are the people who work with their companies to take influential strategic decisions. In the list below there are people who have worked on network transformation projects, on IT strategy and systems integration, on key agreements with business partners and on tactics to reach new markets.

Executives were nominated for the Global Telecoms Business 50 CMOs to Watch by colleagues in their companies, by readers and by GTB staff after many discussions with senior executives throughout the industry. In the final 50, some major companies are missing — sometimes because after many enquiries

we were told there is no person with an overall marketing task in the group. In more than one case a CMO has left — or is about to leave — and has not yet been replaced.

We have not insisted on the CMO title throughout: this list includes chief commercial officers, a chief brand officer, a chief operating officer and one executive whose responsibilities include innovation and technology as well as marketing.

CMOs include people who trained as computer engineers and chemists as well as marketers and business administrators. There is also a slightly better gender balance than in most sectors of telecoms: 12 of the 50 are female.

Global Telecoms Business will continue to recognise the role that CMOs play in our coverage of the industry.

Please note these are 50 CMOs to watch, not simply the CMOs from the 50 largest companies in the industry. from 2015 onwards.

Fahad Al Hassawi

Chief commercial officer, du



Fahad Al Hassawi has been the chief commercial officer of Emirates Integrated Telecommunications — which trades as du — since June 2013, after a time as chief human resources and corporate services officer and executive vice president of human resources.

Before joining du, he was vice president of human resources (employee services) at Emirates Airlines. In this role he devised and implemented HR improvement processes. He also established and executed Emirates Airlines's national career development strategy.

Al Hassawi started his career as a first lieutenant engineer for Dubai Police. He holds a masters in industrial engineering from the University of Miami in the US.

for society at large. He also provides strategic brand and marketing advice for the TeliaSonera group.

Bäcklin originally trained as an engineer and started his marketing career with Philips Electronics. At Stockholm agency Hilanders, he progressed from brand strategist to partner and ultimately managing director, bringing on board business-to-business clients as diverse as Canon, Rockwool and TeliaSonera.

Mert Başar

Chief marketing officer of TTNET at Türk Telekom



Prior to joining TTNET as chief marketing officer, Mert Başar worked for Turkcell as marketing director

for corporate customer segment for six years.

He worked at Compaq Computer and Hewlett Packard as Sales and Marketing Manager and undertook various responsibilities in related fields.

At Türk Telekom, Başar has led the company's Internet4All project to increase internet access in provinces with low internet penetration. The company provided free-of-charge access to its online education platform, Vitamin, and incorporated it into this business model.

This project makes the company's products and services available for low-income people and at the same time it offered face-to-face internet training for newcomers to the internet.

As a result, there are 250,000 new users of the internet, mostly in low-income families.

Arun Bhikshesvaran

Head of sales and marketing, Ericsson India Global Services



Arun Bhikshesvaran was chief marketing officer of Ericsson until October 2014 but has recently

become head of sales and marketing at Ericsson India Global Services. As CMO, he was responsible for driving the global marketing strategy focused on enhancing Ericsson's role in the evolving networked society.

He has been with the Ericsson group for almost 20 years. Bhikshesvaran's previous position was senior vice president of strategy and chief technology officer for Ericsson North America. He has served in a variety of roles including multimedia and infrastructure solutions, systems solutions and integration, field engineering, R&D and global product marketing.

Johan Buse

Vice president of consumer marketing, SingTel



Johan Buse has worked with Deutsche Telekom's Croatian subsidiary T-Hrvatski Telekom, Axis in Indonesia,

STC in Saudi Arabia and T-Mobile in the Netherlands.

At SingTel he has begun a campaign to make the incumbent warmer and better loved in its home market. He has been quoted as saying: "Ultimately, my belief is that a company needs to have a soul."

He has been simplifying its brand names and introducing unlimited flat-rate daily roaming packages for customers travelling outside Singapore.

Brad Bush

Chief marketing officer, Genband



Since taking over as chief marketing officer for Genband in July 2013 Brad Bush has evangelised

Genband's move away from a hardware-focused infrastructure company to a leading provider of software-based solutions for communications service providers, enterprises, systems integrators and software vendors. Many prominent outlets are positioning Genband in the manner Bush has envisioned.

Bush brings a mix of business, technical and marketing experience to the role of CMO, having served as CIO, chief of staff to the CEO and sales operations leader for Genband.

He has spearheaded the successful launch of strategic initiatives including its enterprise business, a network transformation campaign, a mobility campaign designed to highlight its mobile capabilities, and the introduction of the company's new platform-as-a-service.

Selina Chong

Chief marketing officer, Hong Kong Broadband Network



Selina Chong is a rare breed CMO as she leverages over 25 years of experience in

multinationals such as American Express, Fidelity and Citibank.

Rickard Bäcklin

Vice president brand and marketing, TeliaSonera International Carrier



As client director and now as vice president brand and marketing of TeliaSonera

International Carrier, Rickard Bäcklin has led a transformation, making integrated marketing and communication a core function of TeliaSonera's global wholesale arm.

He has raised the position of wholesale telecommunications to that of carriers of the internet, bringing new ideas to life and adding value

Months after Chong joined in January 2012, the company was sold for \$670 million in a management buy out to private equity firm CVC Capital Partners, one of the largest such transactions in Hong Kong's history.

In the past two years, Chong has effectively re-branded HKBN as an independently strong brand, aligned residential product strategy to facilitate price increases and improved sales operation efficiency.

In the process, the brand has moved away from the perception of a cheap telecom, enabling HKBN to penetrate deeper into the luxury residential market and corporate segments.

Anthony Christie

Chief marketing officer, Level 3



Anthony Christie has positioned Level 3 to deliver solutions that help enterprise, government, and

wholesale customers achieve growth, efficiency and security for their businesses.

As part of the Level 3 brand commitment to operate with the customer first, Christie is responsible for bringing the company's customer experience function into the marketing organisation to ensure that Level 3 views the customer as the core of all activity end-to-end. This includes everything from future product development to day-to-day customer interaction.

As Level 3 has announced plans to acquire TW Telecom, the solid brand foundation focused on local-to-global connectivity, reliability and security will make Level 3 an even stronger competitor.

David Christopher

Chief marketing officer, AT&T Mobility



David Christopher leads all marketing, including product strategy, service and product management,

pricing, advertising and go-to-market execution across AT&T's wireless services and devices. He oversees AT&T's developer programme and its more than 50,000 members. Key accomplishments over the past year include:

- AT&T Next, a major shift in how customers purchased new devices.
- Mobile share value plans for families and individuals.
- A sponsored data service, a new way for customers to enjoy mobile content and apps.
- A new retail store concept that features innovative merchandising elements.
- A new marketing platform, The Mobile Movement, which highlights how mobile innovation and our network affects young people's lives every day.

Mary Clark

Chief marketing officer, Syniverse



Serving as Syniverse's CMO since early 2014, Mary Clark has already achieved extraordinary

accomplishments recognized by numerous 2014 awards. Under Clark's leadership, Syniverse launched the Mobile Intelligence Portal, which allows mobile operators to monetise subscriber data by making it available for enterprises to provide highly customised employee communications, customer service and marketing campaigns to mobile users. Marketing efforts have secured agreements with MasterCard and multiple top-tier mobile operators.

Additionally, Clark played a critical role in Syniverse's acquisitions of MACH and Aicent. As a result, Syniverse is the leading global transaction processor that connects more than 1,500 mobile service providers, enterprises, ISPs and OTTs in nearly 200 countries and territories.

Cathy Coughlin

Global marketing officer and senior executive vice president, AT&T



Cathy Coughlin has overseen AT&T's brand strategy, advertising, corporate communications,

events and sponsorships worldwide since 2007.

Among her many accomplishments, Coughlin put in place AT&T's brand platform, Rethink Possible, which reflects the company's ongoing drive for innovation.

She is proudest of It Can Wait, AT&T's commitment to ending the deadly practice of texting while driving. Under Coughlin's direction, It Can Wait has spread the word that it's not OK to text while driving. To date, It Can Wait has generated more than five million pledges to never text and drive.

Peter Dorr

Managing director of strategic marketing, sales and customer service, Liberty Global



Peter Dorr was vice president of marketing and sales at UPC Netherlands — part of the Liberty Global group

— from 2004, reporting to the Dutch CEO and the European board.

Since January 2011 he has been managing director of strategic marketing, sales and customer service, heading a department that focuses on marketing communications, marketing operations, customer care and performance management. Its key

objective is to support operations in the 11 countries across Europe where Liberty Global operates by providing expertise, guidance and support in the marketing and sales of products and services, customer life cycle management and care in line with the company's vision.

Pippa Dunn

Chief marketing officer, brand and consumer, EE



Pippa Dunn is responsible for the profit and loss of EE's consumer division, including Orange and T-Mobile

commercial targets, proposition development, customer loyalty, product and device management. She is also responsible for EE's brand team.

Previously, Dunn was vice president of Orange propositions for Everything Everywhere, and before then she was responsible for the prepay arm of Orange as director of pay-as-you-go.

Dunn has been with Orange since 2003, working first in marketing for Orange Group, before becoming UK brand director.

She joined Orange from UK cable operator NTL where she was product marketing director for broadband.

Brian Finn

Group chief strategy officer, Digicel



Brian Finn works with the group CEO of Digicel and senior management team on strategy formulation with the

ensuing operational implementation group-wide.

Since joining Digicel in 2005, Finn has worked in several roles including commercial director for Digicel Trinidad & Tobago, chief executive officer of Digicel Central America and over six years as group chief commercial officer for Digicel Caribbean, Central America and Asia-Pacific. He is now based in Singapore.

Before Digicel, Finn held marketing leadership roles in Hewlett Packard, Eircom and Sigma Telecom.

Peter Finter

Chief marketing officer, Gigamon



Peter Finter has a 25-year track record of success in channel, enterprise and service provider marketing.

He has held multiple senior global roles responsible for marketing and go-to-market strategy and execution, most notably at BT, Nortel and Juniper Networks.

20 of the 20 Top Telcos Get Better Results

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As CMO at Gigamon, Finter is responsible for product management, business development and all aspects of marketing. He is responsible for marketing, business development and product management for Gigamon, a 400-employee start-up in Silicon Valley.

With over 1500 customers to date, Gigamon's patented Visibility Fabric is used by 66% of the Fortune 100, 300 of the Fortune 1000 and 50 of the top 100 global service providers.

Mikhail Gerchuk

Group chief commercial officer, VimpelCom



Mikhail Gerchuk is a high performing and versatile business leader, serving as VimpelCom's group

chief commercial officer and acting head of its CIS business unit.

Gerchuk has fostered deep commercial relationships with a wide range of partners, including leading businesses Google, MasterCard and Microsoft, which provide high quality, value added content and services to enhance the user experience of VimpelCom's 200 million-plus mobile customers.

Critical to attracting these tier one names has been his development and implementation of an innovative hub partnership model. Built on a standardised infrastructure, the agile model enables partners to directly connect with VimpelCom's operating brands, affording cost effective integration and achieving quicker rollout times so that benefits can be passed onto the customer.

Cynthia Gordon

Chief commercial officer, Ooredoo



Cynthia Gordon is responsible for strategic direction and operational performance of the various commercial

functions across the Ooredoo group.

She launched the Ooredoo brand in seven markets, repositioning on data leadership. She has accelerated growth in business-to-business and data, which now contributes 21% of group revenue

She has led a digital transformation, with strategic partnerships and innovative offerings to support Ooredoo customers' digital lifestyle.

Before joining Ooredoo, Gordon had leading roles at Orange and before that she was group chief commercial officer at MTS — the first Russian brand in the Financial Times top 100 global brand list.

Fabrizio Gorietti

Vice president marketing, Telecom Italia Sparkle



Fabrizio Gorietti is responsible for Telecom Italia Sparkle's marketing and business development

activities.

He has a degree in electronic engineering and started his career in Telecom Italia Mobile services division in 1992. His career focused first on the marketing and business development start up activities of Telecom Italia Mobile, at first responsible for the product and services development unit, for consumer marketing in 1999 and then TIM marketing in 2005, overseeing marketing activities in Italy and for Telecom Italia's mobile subsidiaries in Europe and South America.

Following TIM and Telecom Italia's merger he was in charge of the consumer marketing unit from 2009 and later as head of sales and head of customer operations.

Michael Hagspihl

Marketing director at Deutsche Telekom's Telekom Deutschland



Michael Hagspihl has been marketing director of Telekom Deutschland — the domestic German

fixed and mobile business of Deutsche Telekom — since October 2012. He is responsible for sales in the retail, business and wholesale market, including value added services and the no-frills subsidiary Congstar.

Hagspihl started his career with T-Mobile in 2000, where he was responsible for the development of partnerships for its mobile portal T-Motion. He led the development of T-Mobile's then innovative open internet strategy, called Web'n'walk.

He began his career in the consumer goods industry, with Philips, Bosch, Siemens and Miele.

Earlier at Deutsche Telekom he has headed the company's terminal strategy and was global senior vice president for strategic partnerships.

Dale Hooper

Chief brand officer, Rogers



Dale Hooper leads the team responsible for brand, advertising and sponsorship at Rogers

Communications.

Following Rogers' acquisition of a 12-year, \$5.2 billion Canadian broadcasting deal with the National Hockey League earlier in 2014, Hooper oversaw the launch one of

the company's largest integrated marketing campaigns for Rogers and Rogers Media-owned Sportsnet, including unveiling Rogers NHL GameCentre Live and Rogers Hometown Hockey.

He also recently introduced the company's new US roaming programme, Roam Like Home, as well as a Rogers brand campaign that looks back at the company's innovative past.

Duncan Howard

Chief commercial officer, Zain Group



Duncan Howard became chief commercial officer of Zain Group in July 2014. Under this

role, he will oversee and enhance all commercial, marketing, branding and advertising areas across Zain's eight-country Middle East and African footprint.

Howard joined the group in September 2013 managing operations and bringing about an increased focus on commercial and operational performance. He has also laid the foundations for the establishment of group enterprise initiatives that will be rolled out across the company.

Howard has strong commercial and operational expertise that have included key roles as chief commercial officer for a quad-play provider offering mobile, fixed, data and both broadcast and IPTV services.

Hani Iskandarani

Head of marketing and corporate communications, Gulf Bridge International



Hani Iskandarani's commitment to innovation and his industry knowledge have built powerful

bridges between telecommunications and both mainstream media and society at large.

Iskandarani has taught GBI's marketing team to look beyond company borders, industry growth and corporate objectives.

One of the most valuable lessons is that achieving and surpassing the company's goals should not be the sole contribution to the industry. It is expanding individuals' horizons about the importance of ICT, as well as understanding the contribution it makes to empowering societies and growing businesses.

His commitment to various strategic programmes within the ITU and the Samena Telecommunications Council has contributed widely to the industry.

Mari-Noelle

Jégo-Laveissière

Executive vice president of innovation, marketing and technologies, Orange



Mari-Noelle Jégo-Laveissière, a member of the executive committee of the Orange group, was promoted to her

present position in March 2014.

She has previously been senior vice president of international and backbone network factory and senior vice president for research and development, responsible for networks, products and services research.

She has held various positions in the group since 1996: vice president for the home marketing division of Orange France, head of a French region where she was in charge of technical and commercial entities for mass markets and business clients.

Jégo-Laveissière has an engineering degree and a doctorate in quantum chemistry.

Alistair Johnston

Marketing director, Telkomsel



Alistair Johnson has been marketing director of Telkomsel in Indonesia since

August 2012, after two years as chief marketing officer of Augere Holdings in Dubai, building and deploying wireless broadband networks into developing countries.

Earlier in his career he spent a number of years with the Virgin group, first as head of telecommunications in Asia and then as head of commercial at Virgin Mobile in the UK. He followed this by heading prepaid operations at Orange in the UK and then at Telefónica O2 in the UK.

He began his career in Andersen Consulting — now Accenture — and has also worked for British Sky Broadcasting in the UK.

Yigit Kulabaş

Chief corporate marketing officer, Turkcell



Yigit Kulabaş has been chief corporate marketing officer since March 2013, having joined from Ericsson,

where he was global marketing director, responsible for development and execution of global marketing programmes, campaigns and initiatives.

At Ericsson he aligned the marketing activities among all three business units, mobilising the group's global marketing activities in over 170 countries and 23 market units. He

joined Ericsson in 2005, first serving as head of the company's operations in Turkey and Israel. Kulabaş has also positions at Oracle and Microsoft.

He graduated in computer engineering from Bilkent University, from which he received a master's degree. He holds a doctorate in marketing from Istanbul Technical University.

Tim Krause

Chief marketing officer of Alcatel-Lucent



Tim Krause is responsible for Alcatel-Lucent's global marketing efforts as well as external

communications. In this role, he also leads Alcatel-Lucent's diversification strategy and the development of the company's business in key segments such as: cable, oil and gas, transport, utilities and the public sector.

He was previously senior vice president in charge of Alcatel-Lucent's AT&T customer team, one of the company's largest accounts, and was earlier senior vice president of marketing for Alcatel's fixed communications group — before the merger with Lucent — from 2001 to 2004.

He has also been senior vice president strategy for Alcatel-Lucent's Americas Region.

Shirish Lal

Chief marketing officer, CenturyLink



Shirish Lal joined CenturyLink, the third largest telecommunications company in the US, in 2005 and has

been instrumental in helping to redefine the company from a traditional telecom provider with \$2.5 billion in revenue to a global IT leader with revenues of over \$18 billion.

He is responsible for delivering innovative solutions across the consumer and business segments, ensuring the company is well positioned in the industry. Lal earned his bachelor's degree from the Massachusetts Institute of Technology, and his MBA from Harvard University.

Flavio Lang

Chief marketing officer, TIM Fiber



Flavio Lang has been chief marketing officer of Tim Brasil's ultra-broadband project, TIM Live, since 2011.

He joined TIM Brasil, part of the Telecom Italia group, after working for two years at Brazilian operator Oi, and before that at Brasil Telecom, where he was responsible for customer relationship, including customer

care strategy, business process management, call centre planning and financial and quality performance.

He is a skilled professional, with deep understanding of product management and development. He has great ideas on how to improve performance of the products and projects under his leadership. He values the power of solutions, possesses strong leadership and teamwork skills, and his grasp of international business is solid.

Mike Last

Director, marketing and international business development, WIOCC



Mike Last's marketing insight and expertise have been instrumental in WIOCC's

transformation into a successful, multiple award-winning international capacity and network services wholesaler.

Last's marketing activities have made a vital contribution to WIOCC's growth and success. WIOCC is now widely recognised as the number one supplier of high-performance bandwidth solutions into and out of Africa.

Last has built a local marketing team in Kenya that delivers world-class communications initiatives and materials into an increasingly competitive and noisy international capacity marketplace.

Responsible for external and internal marketing for Africa's carriers' carrier, he also works with WIOCC's shareholders from across Africa to build their marketing knowledge and expertise — particularly relating to wholesale markets.

Vasyl Latsanych

Marketing vice president, MTS



In his capacity as MTS group CMO since September 2011, Vasyl Latsanych has managed to increase

voice usage by promoting tariff plans with free on-net calling, boosting customer loyalty and dramatically reducing churn to the lowest level in Russia.

This has enabled MTS to consistently grow data traffic revenues at a pace of roughly 40% a year by introducing innovative video on demand tariff plans, increasing penetration of smartphones and stimulating data usage.

He also oversaw the company's expansion into business lines complementary to its core mobile business, including financial services, e-commerce and satellite TV.

Quintin Lew

SVP/CMO marketing, Verizon Global Wholesale



The traits that set Quintin Lew apart from other executives are his unwavering commitment to the customer; his focus on developing and implementing to a strategic plan; and his ability to connect with people.

Lew engages with customers, along with sales, to ensure that he hears, first-hand, what customers want and need from the services they buy from Verizon. He steps up to offer guidance and help, based on those calls, and drives the actions to conclusion.

Lew is methodical and strategic in his thinking. He is always looking ahead and has a plan laid out for all activities in the near future. He plans his work and works his plan. Nothing happens in marketing by accident.

Tom Malleschitz

Director of marketing, Three UK



Tom Malleschitz joined Three UK in July 2011 as director of marketing. He is responsible for all

marketing activities including brand

and advertising, product, commercial finance and strategy.

Before joining Three UK, Malleschitz spent 10 years at Three Austria, the last four as chief marketing officer. His responsibilities in this role included proposition and products, terminals, CRM, commercial programme management and marketing communications.

Malleschitz joined the Three Group from Austria Telecommunication — a joint venture of Nortel Networks and Kapsch, the local telecoms equipment manufacturer — where he spent four years responsible for product and project management.

Paul McNab

Chief marketing and strategy officer, JDSU



Paul McNab joined JDSU as chief marketing and strategy officer in September 2014 after 16 years

at Cisco and having founded a stealth start-up that developed a disruptive software-based network solution.

McNab has aligned JDSU as a new agile organisation, with a unified vision and strategy to change the company's identity, role and relevance. JDSU will launch two new companies focused on their unique markets.

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Executives have collaborated under McNab's leadership to help define the vision, organisation and strategy. He has been the catalyst to removing the silos between business units and functions to create one integrated organisation.

Michael O'Hara

Chief marketing officer, GSMA



Michael O'Hara leads all marketing for the GSMA, from delivering marketing programmes that

support its key initiatives and advocacy activities to marketing the company's global events portfolio.

O'Hara has led efforts to communicate the benefits that mobile is delivering worldwide, through network investment, job creation and contributions to public funding, and by transforming adjacent industries.

He was a key driver in the creation of the Mobile 360 series of events, exploring critical mobile industry trends and issues regionally.

O'Hara has played an important role in the continued strong growth of the GSMA's flagship event, Mobile World Congress, which has grown from 47,000 attendees in 2009 to more than 85,000 in the 2014 edition.

Rita Okuthe

Marketing director, Safaricom



Rita Okuthe leads and manages Safaricom's marketing organisation in order to achieve the brand

vision of transforming lives through initiatives that resonate with its 21 million customers at all touch points.

Integral to this is the achievement of company revenues through the consolidation of existing products and services, while at the same time continuously identifying other market needs. The successful and profitable launch and management of various products and services is integral to this objective.

Okuthe was previously head of consumer propositions, managing the business's core revenue-generating products in the consumer segment, including prepaid and postpaid voice, SMS, data and roaming products, accounting for approximately 80% of total revenues.

Zacharias Piperidis

Chief operating officer, OTE group



Zacharias Piperidis has been COO of OTE since 2011. His extensive technical, commercial,

managerial and executive experience has been critical for implementing significant projects within the

company: consolidating the new customer culture cultivated by OTE; turning around the group's public perception through a series of intelligent and ambitious campaigns; contributing to the immense success of OTE TV, a service paving new ways in home entertainment; and boosting the company's performance in broadband to impressive standards.

As chief commercial officer since 2007 for Cosmote, the group's mobile branch, Piperidis has greatly contributed to its development into the largest mobile network operator in Greece, its revenue share having expanded by about 15 points during the past seven years.

Izlyn Ramli

Vice president, group brand and communication, Telekom Malaysia



Izlyn Ramli has been with Telekom Malaysia since 2010, first as vice president of group corporate

communications and, from June 2014, in her present role, safeguarding and enhancing TM's image and reputation.

Key roles include strategic communications advice, crisis communications, managing selected stakeholder relations, developing and aligning key strategic and group messages among the business lines and operating companies of Telekom Malaysia. She is a member of Telekom Malaysia's management committee and group leadership team.

Ramli liaises with external parties such as the government, ministries, regulators, other related agencies and national bodies, as well as international forums and organisations focused on ICT development and ICT for development.

Rainer Rathgeber

Chief commercial officer, Etisalat Group



Rainer Rathgeber has 21 years of experience in the telecommunications industry, gained in consulting and

industry roles across four continents. He has been at Etisalat since January 2013. He was previously with OTE as senior vice president for marketing in south-east Europe.

He began his work in the industry at AT Kearney where managed clients and led projects in the telecommunications and high tech sectors across Asia, the US, South America and Europe. He joined the Deutsche Telekom group where he held the positions of head of strategy for T-Mobile Germany and, at the same time, executive vice president sales and service strategy for T-Mobile International.

Diego Scotti

Chief marketing officer, Verizon



Diego Scotti has been Verizon's CMO since October 2014. He oversees all aspects of Verizon's global

brand management, including advertising, consumer insights, digital marketing, creative development, marketing effectiveness, media and sponsorships, social responsibility, and employee communications.

Scotti joined Verizon after three years as CMO and senior vice president at store chain J.Crew, and he has also worked in senior positions at American Express and Condé Nast, giving him 20 years of experience in three different industries and corporate cultures.

He specialises in five key areas: strategy development; brand building; customer analytics and CRM/loyalty; e-commerce and digital marketing; and international expansion.

Michael Sievert

Executive vice president and chief marketing officer, T-Mobile US



Mike Sievert, appointed as CMO in November 2012, is responsible for strategic development and

execution of all marketing, product development and pricing programmes and activities for T-Mobile US.

Before joining the company, Sievert was an entrepreneur and investor involved with several Seattle-area start-up companies, most recently serving as CEO of Discovery Bay Games, a maker of accessories and add-ons for tablet computers. Earlier he was chief commercial officer at Clearwire, a broadband WiMax company, responsible for all customer-facing operations.

Sievert spent three years as corporate vice president of the worldwide Windows group at Microsoft, and earlier was executive vice president and CMO at AT&T Wireless.

Marc Sommer

Senior vice president of business development, Deutsche Telekom



Marc Sommer was appointed to his present role in early 2014, after two years as vice president of product marketing for

Europe at Deutsche Telekom, where he promoting the Life is for Sharing motto, aiming to give customers "new and exciting ways to share and engage with their friends and families".

He joined DT after two years with MTS in Moscow, where he was

products director, with a strategy of making phones central to users' lives, resulting in higher usage and increased loyalty to the operator.

Sommer began his telecoms career at Vodafone in Germany in 2004, after spells working in Airbus, the supermarket group Aldi and at the German embassy in London.

Alexander Sperl

CMO and CCO of A1 Telekom Austria



After several years in brand management at Procter & Gamble in both Austria and Switzerland

Alexander Sperl spent some time with Microsoft in Germany and the US.

In 2000, Sperl moved on to Telekom Austria's mobile division — then called Mobilkom Austria — where he was promoted to marketing director in 2004.

Sperl gathered international experience at two subsidiaries of the group: first as director of marketing and sales at Si.mobil in Slovenia and then in December 2006 as CEO and CMO of Vipnet, Croatia.

Sperl has been CCO and CMO of A1 Telekom Austria in Vienna since August 2010.

He is a graduate from the Commercial Academy, Vienna, following studies at the Hawaii Pacific University in the US where he gained a bachelor's degree in financial accounting and an MBA in international business administration.

Robert Stegges

Senior director of marketing, Europe, NTT Communications



Rob Stegges has been with NTT Communications in Europe for over 10 years. In his role, Stegges is responsible for

accelerating NTT Com's presence throughout the region.

Steggles plays a critical role in understanding the fast-moving industry that NTT operates in and identifying trends and market opportunities which match the company's goals.

He has over 25 years of experience in high tech industries, having worked for companies such as BT and Reuters before NTT Com.

He is especially experienced in the areas of infrastructure as a service, large scale private IP networks, business process outsourcing and cloud computing. At the start of his career, Stegges wrote and helped program several classic interactive fiction games.

Stacey Trimnell-Ritchard

Global director of marketing, vertical solutions, hybris software



Since 2011 Stacey Trimnell-Ritchard has been responsible for developing innovative business and marketing plans

designed to expand and grow hybris globally. Under her marketing direction, hybris has become a market leader in telecoms and is quickly gaining ground globally in the financial services industry.

Trimnell-Ritchard brings with her a wealth of marketing expertise gained from 18 years focused on the sector and has developed and delivered on a range of sales enablement, internal and external communications and partner growth programmes. She has been instrumental in the successful launch of a new dynamic industry-specific website and content hub, as well as various marketing infrastructure and programme development projects.

Tom Tudor

Chief marketing officer, Liquid Telecom Group



Tom Tudor joined the Liquid Telecom group in January 2013 and is responsible for brand, marketing

and communications.

He has rebranded Kenya Data Networks as Liquid Telecom, rationalised the Liquid Telecom product portfolio and, after the acquisition of insolvent Rwandatel, is now working on the launch of a new Rwandan Telecom retail brand, as well as the launch of an IPTV platform pushing African content.

Other brands in the portfolio include Realtime and CEC Liquid Telecom in Zambia, ZOL in Zimbabwe, the East African Data Centre in Kenya and Infocom in Uganda.

From 2005 until 2012 Tudor was responsible for marketing and communications strategy at African wholesale carrier Gateway Communications.

Mike van den Bergh

Chief marketing officer, PCCW Global



With over 20 years' experience in Africa's developing communications industry, Mike van

den Bergh has a deep understanding of the pan-African telecommunications market.

As the former CEO of Gateway communications, he was instrumental

in developing the company's leading position in the African carrier community and transforming Africa's telecoms markets. He has played a leadership role in the telecommunications industry, chairing a number of major industry associations, both in South Africa and internationally.

As CMO of PCCW Global, Van den Bergh's key responsibilities include branding, market strategy, culture and communications. He is also managing director of HKT Global Development Services.

Carlotta Ventura

Group senior vice president brand strategy and media, Telecom Italia



Carlotta Ventura has been with Telecom Italia since the start of 2000, and in her present role since January

2014.

Key responsibilities include development of TI Group brand management policies. Ventura is responsible for ensuring brand management policies at group level and corporate identity as well as positioning and communication strategy.

One of the most recent projects is Working Capital, aimed at boosting high-potential start-ups in the Italian digital sector.

Ventura ensures the development of Telecom Italia's media strategy, including the implementation of advertising campaigns, sponsorships and corporate events, initiatives and projects for developing brand equity reputation as well as research activity and competitive benchmarking on brand perception and advertising.

Chris Williams

Division president and head of global marketing, Amdocs



Chris Williams is passionate about driving top-line revenue growth by parlaying market or technology

disruptors, anticipating market requirements and launching solutions resulting in leadership positions in their respective markets.

He specialises in defining strategy, creating market leading offerings and driving sales and marketing execution. He can help companies transition from pure products to services and solutions designed from the customer perspective. He is adept at building partnerships that deliver tangible value.

Williams has a strong understanding of the role of innovation in helping businesses transform, with areas of focus including social, mobile, analytics and cloud.

He believes in realigning companies around the voice of the customer and driving revenue by linking company strategy to market development.

Suzi Williams

Global brand and marketing director, BT



BT's brand value has reached \$15 billion, around a third of BT market cap, after a successful brand transformation started

in 2008 under Suzi Williams's leadership.

BT's chairman, Sir Mike Rake, describes her as "brave, tenacious, and smart ... she knows how to get things done."

Williams led BT's bid to become a London 2012 sponsor, and ran the company's London 2012 marketing programme, paving the way for the successful launch of BT Sport.

Some of the other partnership deals she has struck include the British Paralympic Association, the first International Festival for Business in Liverpool and Prince Harry's Invictus Games.

Williams is the driving force behind BT's new Marketing Academy, coaching more than 700 marketers.

Julie Woods-Moss

Chief marketing officer, Tata Communications



Julie Woods-Moss is both chief marketing officer at Tata

Communications and the company's CEO of next-generation business. As CMO, a position she has held since September 2012, she is responsible for all company-wide marketing and communications.

The next-generation role gives her profit-and-loss responsibility for the world's Silicon Valleys.

Woods-Moss is a member of the advisory board for the Tata Group brand, valued at \$21.1 billion in 2014 by Brand Finance.

She has worked for IBM and UPC. Woods-Moss joined BT in 2004 and became chief marketing officer and president of strategy with responsibility for its £5 billion products and services portfolio.

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Global Telecoms Business asked CMOs about the impact of virtualisation technologies on their market and their marketing strategy. These are their answers

CMOs say virtualisation will bring benefits to service providers and their customers



Mike van den Bergh, chief marketing officer, PCCW Global

Do you believe that virtualisation will offer benefits to service providers and their customers? If so, what do you believe those benefits to be?

Reinhard Zuba: In general I believe that virtualisation will help us to be both more flexible with our offering on the market and at the same reduce our production costs for single services.

For our customers this will result in a much broader portfolio of services that we can offer to them and additionally leads to new innovative ways of providing those services to them. Offering try-and-buy models to customers will be much easier than today, and likewise virtualisation gives us also the ability internally to play around with different propositions in a very low cost and effective way before launching on the market.

Rickard Bäcklin: We are living in the age of the customer, so let's start there. Virtualisation will help service providers to deliver a more immersive end user experience. This is becoming increasingly important as the Internet's role moves from just being business-critical, to being online-life-critical.

Of course there's more to it than virtualisation; that's just part of the puzzle. But virtualisation will offer a real benefit to service providers. It will give them the agility to scale capacity and its costs, to the demand that will pay for them. Essentially, it will remove the risk of under-provisioning the network to keep costs down, as well as the cost of over-provisioning the network just in case. That's when virtualisation will go from being an interesting idea to a serious business proposition.

Mike van den Bergh: Clearly virtualisation offers benefits to both service providers and their customers — improved scalability, continuity, performance and resource efficiency.

[There are] cost savings, server consolidation, reduced data centre footprint, costs of physical hardware and management time, energy savings, going green and so on, resulting in improved margins and/or price reduction.

[Virtualisation] enables remote management and configuration which reduces logistical overheads for service providers and

reduces lead time for provisioning/activation or modification of services.

[There are] potential new revenue streams from availability of new service offers: on-demand, agile, QoS managed.

In most cases, various network functions would be appropriate to virtualisation. Basically anything focused on data look-ups, compartmentalisation, and so on would really see efficiencies in cloud technology — compute virtualization — and NFV, leveraging cloud VMs for network services.

Are there particular products and services that you think will benefit from virtualisation? Or will virtualisation offer benefits in other ways?

Rickard Bäcklin: It's all about allocating resources when and where they are needed. This can be computing power, bandwidth or security in a network. It means they can be turned on or off at the push of a button — or even automatically. As a carrier, we can see real benefits in being able to offer our customers' bandwidth-on-demand services. This gives them far greater control of costs, allocating capacity only when the demand is there to pay for it, without risking service quality.

The other area where there will be a real benefit is in security. Operators will be able to manage their own virtual space in the network and have far greater control over firewalls and security.

An international carrier like TSIC has a very real advantage when it comes to these services. We own our own backbone, a highly programmable, high capacity network infrastructure, and we have the people devoted to deliver on the demands. This means that we can take classic virtualisation functions like storage and computing power, and meld them into a distributed, high performance solution that can be tailored to specific customer demands.

Reinhard Zuba: Naturally all services that are cloud based by nature will benefit from virtualisation. And for a group of operators like Telekom Austria Group with a mixture of operators that were set up as greenfield operations versus those that were acquisitions and with increasing level of M&A



Rickard Bäcklin, vice president brand and marketing, TeliaSonera International Carrier



Reinhard Zuba, group CMO, Telekom Austria Group

activity we are facing a multitude of local legacy systems that sometimes are barriers to a smooth product rollout across the group.

Virtualisation will help us big time here to create synergies in our product development process, benefiting our customers in all Telekom Austria Group markets with shorter time to market and a faster replication of best practices into multiple markets.

Mike van den Bergh: From a carrier's perspective, the place where benefits of virtualisation can be realised in the most straight-forward manner will be the network edge and the customer site.

On one hand we can replace expensive CPE with a low-cost termination device, and migrate the CPE functionality from customer site to the network edge. On the other hand we can integrate the functions of stacked devices at customer site into VNFs in a single programmable device installed at customer site.

The immediate suspects will naturally be the existing CPE functions such as a router, a switch, a firewall, NAT, traffic optimisation, voice and video gateways etc.

The network core will probably take longer to virtualise. The port-density and robustness of existing core devices cannot be easily replaced by white-label virtual devices. We are keeping our eyes open though.

Are you planning to start marketing virtualisation-based services to your customers? If so, do you see any particular challenges for CMOs here?

Rickard Bäcklin: Like any new technology, virtualisation is going through a classic hype cycle. We plan to release virtualised services to our customers, but not until they have been proven to our satisfaction. They need to be stable, secure, and have a robust set of standards governing them. But even more importantly, we won't release them until they can offer real and measurable value to our customers.

When the time comes, these services will be relatively easy to release. Because customers can take as much or as little of the service as they need, we can release them on a try-before-you-buy deal, so that they can see for themselves how it can help their business.

For CMOs, I think the biggest challenge will be to step out of their technical comfort zone and focus on what virtualisation will mean for end users. Our industry often becomes too focused on three letter abbreviations and technical demands, and loses sight of what it means in terms of end user demands. After all, they're the reason for everything we do.

Reinhard Zuba: We definitely want to use the internal benefits from virtualisation to provide our customers with world-class services they can leverage in their own core business. The challenge for marketing and sales here is more than ever an aligned approach with technology.

That is why we are working in sync here with our colleagues in the CTO area to have an aligned launch approach. They need to know what propositions we want to offer to our customers early on and we need to understand what are the technological capabilities in

our networks on a timeline. This leads to a synergetic rollout that incorporates both sectors requirements.

Mike van den Bergh: Arguably we have been delivering virtualisation based services for more than a decade. We have been offering and delivering managed virtual private network services since 2002. PCCW Global is already developing virtual versions of existing services such as security, QOS management, content delivery, voice, video, cloud storage and compute, virtual desktop and many others — some of which have already been rolled out and delivered.

Do you have doubts about the case for virtualisation as put by vendors and others? If so what are they?

Rickard Bäcklin: I am confident in the set of services that we are planning to offer. Where I see the danger is that hype may be creating expectations that virtualization can't meet — not initially anyway. Virtualisation is not a silver bullet. It needs to be considered as part of a broader network approach that, at the end of the day, is only as good as the human factor that makes it all work. This is especially true when it comes to SDN and NFV. These are still in the beginning of their maturity cycle.

At the end of the day, virtualisation will create some very interesting opportunities. It will give service providers a greater ability to adapt to changing demands. Because even though we can't predict the future, we can be ready.

Reinhard Zuba: I would not call it doubts but over the years we have developed a healthy challenging attitude towards the ideas that are brought forward to us by technology vendors.

Today we always check ourselves if the vendor arguments are based on a solid understanding of our markets and our customers, or if they purely follow their own business interests. This logic also applies to virtualisation.

For us virtualisation definitely has a case because the benefits come from scaling and as a group of operators that is exactly what we can leverage.

However as said closely aligned with our colleagues in the CTO area we will work out the right approach for our customers and our business. Security issues are some of the specific topics we discuss with our vendors so that virtualisation is supporting our approach of bringing smart and secure networks and services to our customers.

Mike van den Bergh: From an operator perspective, no, if it is deployed where appropriate. Cost-savings, agility, speed of delivery, simple logistics increase value of existing service offerings, but we value a virtualisation as an enabler of new services and new revenue streams.

On-demand services, service-chaining and user activated services will generate new revenue from the legacy network infrastructure. Through virtualisation we will be able to bundle and integrate service components into packages that are logistically and operationally prohibitive in a traditional environment. ■

Have you started planning for the 2015 Mobile World Congress yet? Janet Roberts thinks you may be a little late, but offers helpful advice on how to get the best from your efforts

A marketer's guide to getting ready for Mobile World Congress



Janet Roberts: To get the most out of MWC, it's vital to have an integrated strategy where each aspect reinforces the others

Earlier this year 85,000 registrants attended the world's largest mobile conference and exhibition: Mobile World Congress. That was up 18% from the previous year, and many more in the industry converged on Barcelona for meetings and networking.

At that rate, we may see 100,000 registrants in 2015, with the GSMA predicting more than 46,000 C-level leaders and over 1,900 companies at next year's event, which takes place on 2-5 March 2015.

What are the show's implications for companies in the mobile industry? Clearly this is an unmatched opportunity to connect in person with high-level customers and prospects, to build one's brand with prospects, and to attract media interest.

It's estimated that many companies in the mobile space allocate 50% of their annual marketing spend to MWC. But are they getting the most for their money? Let's look at seven tips for maximising return on investment at the show.

You are already late

If you haven't put together your exhibition strategy nine to 12 months in advance and your media and customer outreach strategy six months in advance, you are already late. To get the most out of MWC, it's vital to have an integrated strategy where each aspect reinforces the others.

Content is king

Strive for compelling content — not what's interesting internally but what you are doing with marquee customers that's changing the face of mobile. Unless you are Facebook, Apple or Google, product launches produce a big yawn from journalists and industry analysts. If you are doing something truly new and compelling, better than anyone else, proven by metrics, and with customers that will attest to its value, then by all means use the opportunity of MWC to get the word out.

But remember, competition for mindshare is fierce over the four-day window and journalists have long memories when companies waste their time with hollow news.

One journalist — who specialises in telecoms and has attended MWC for the past 10 years to write for leading publications — says: "I don't think many companies realise the number of advance briefings and meeting requests that we journalists face in the frenetic run up to the show. While we're in Barcelona, we really don't have the time to just

catch-up or hear a routine product update. We're looking to report breaking news."

Maximising your coverage

Begin your outreach to journalists and analysts no later than 15 January to secure interest for briefings both leading up to and during the show.

It's a very good idea to pre-brief journalists with important news ahead of the event, knowing that they likely can only accommodate 20-25 briefings on site and their diaries are subject to change on the ground — especially when the big brands announce last-minute press events.

Make announcements that reinforce your big story in the weeks leading up to MWC to garner interest in booking one-on-one onsite interviews.

Valerie Christopherson, managing director of Global Results Communications, a Los Angeles-based public relations firm that specialises in technology and mobile clients, says: "It's important to recognise what a small window you have to capture the interest of journalists and analysts both leading up to and during MWC. I advise my clients to respect the fact that we're competing for mindshare and need to carefully plan how to best tell our story in a compelling way."

It's all about the meetings

If you are exhibiting at MWC, it's likely that you are spending a large percentage of your show budget on the exhibition space and structure, so you need to use it as effectively and efficiently as possible.

If you have a highly visual offering devote adequate space to showcasing it in ways that communicate its value. If, not be clever in communicating the value and benefits of what you have to offer by creating an experience on your footprint.

Train your stand staff to qualify walk-up traffic and keep your on-site experts free to address qualified prospects.

Remember that MWC gives your company and its executives a once-a-year, highly efficient opportunity to meet face-to-face with important prospects, customers and influencers. Devote stand space to comfortable meeting rooms that offer a quiet haven from the chaos on the show floor.

If you are on a tight budget and have a small stand, consider booking an on-site private meeting room through the GSMA. This affords an opportunity for quality customer interactions away from the hustle and bustle of the show floor.

Seven tips for improving your experience at MWC

1. Book the right hotel room

Likely your company has you covered through its reserved room block, secured through the event organisers and the local hotel bureau. If not, good luck finding anything now. Your best bet for anything within reason from a cost and comfort level will be to consult reputable online hotel booking tools. Aim for an interesting and convenient neighbourhood with transport access plus hotel amenities that include breakfast and free wifi.

2. Go armed with a data plan

Good hotel wifi is a must, but it's not going to help you while you're on-site at MWC, seeing the city, or summoning a taxi late at night. Contact your provider to set up international plans for each of your devices before you leave home.

3. Pack like a pro

Consult the weather forecast but don't necessarily believe it. At MWC you can get a sunburn or get snowed on — maybe both in the same week. It's best to wear layers and have both a rain jacket and sunglasses with you. Make sure your day-bag zips shut to thwart pickpockets. You will wish you'd allotted space in your luggage for an umbrella when you are getting drenched in the taxi queue.

4. Save your feet

This is not a good week to break in new shoes. You will be on your feet more than you might imagine. Ladies, don't give up

the stilettos but do consider stashing them in your tote bag and wearing stylish flats in transit to your meetings.

5. Get some sleep

There's not much sleep to be had during the week of MWC, so for goodness sake don't arrive exhausted. Rest up as best you can the week before. To avoid joining the ranks of the waking dead, sleep for 30 minutes before running off to your evening engagement. If you are exhausted and just going to your room to drop off a bag or change your shoes before heading out again, remain standing. Sitting down can result in a huge nap that wrecks your schedule.

6. Have something to eat with that drink

You will have ample opportunities to sample the local libations 24/7. Remember that Barcelona has an amazing food scene too. Plan early and make your restaurant bookings well in advance to insure you and your business prospects can immerse yourselves in the local cuisine a time or two.

7. See a sight

With some planning, it's possible to squeeze in some time to visit a cool museum, walk through a Gaudi building, take a scenic stroll, or shop with a local designer, even if it's on the way to your next meeting. It's a real shame to spend a week in Barcelona and see nothing more than the Fira and the inside of meeting rooms.

With advance planning in close collaboration with your sales organisation, you can conduct scores of meetings in each room during the week, facilitating customer engagement and securing real business.

Try to make it as convenient as possible for your guests to attend your meetings — schedule them well in advance, provide clear directions to your location on the show floor, escort customers from an agreed meeting point as needed, and welcome them warmly.

One of the worst uses of your stand space is to fill it to standing-room-only capacity with your own people loitering about.

Clearly communicate a policy to prevent this costly real estate from becoming a mini-version of an internal sales conference and forbid internal meetings in your on-site meeting rooms. Packing your stand with your own people is off-putting to your targeted guests and a terrible waste of money.

Network, network, network

Make the most of the myriad opportunities taking place the week of MWC to expand your network. Every moment outside of the show hours is filled with opportunities to connect with experts and leaders in the mobile industry, as well as in industries

that are increasingly focused on mobilising their business and products.

CCgroup, a leading London-based PR firm that serves clients in the mobile industry globally, develops a list of specific networking opportunities that it shares with its clients in advance of MWC.

Richard Fogg, the firm's managing director, says: "Through our ConneCt study of operator buying habits, we've identified the importance of personal relationships with vendors when it comes to awarding business. Industry networking events provide the perfect environment for relationship building and there's no week each year with as many networking events as the week of MWC."

Don't be shy

No matter the size of your company, if you've introduced new offerings that are solving a problem or creating a business opportunity for customers, then get the word out. If you've invented something that's breaking new ground or approaching opportunities in exciting new ways, don't be shy.

Well in advance of the event, make an effort to get to know the GSMA's content team who are the brains behind the conference theme and agenda.

As you are developing your communications strategy it's a good idea to test your ideas in advance with them and understand the key themes they wish to explore.

Make sure you are aware of the guidelines for each year's call for papers and plan for multiple submissions. If you have a compelling idea and can deliver a high-profile mobile player or consumer brand to present with you, you will greatly increase your chances of being selected. Platform speaking opportunities are invaluable to building credibility and raising your company's profile.

If you are granted this opportunity, make the most of it: present content that is of interest to your audience and never, never, never deliver a sales pitch. That's worse for your brand than not speaking at all.

If you've successfully delivered an innovative product or service in the past 12 months, take a close look at entering at the Global Mobile Awards. This prestigious competition affords a highly effective platform for building credibility and elevating your brand.

An additional benefit is that winning or just being short-listed is a great internal morale booster for the technical staff who work so hard to bring new innovations to market.

The competition is fierce so give adequate time and effort to a thorough entry — with supporting facts, data and customer testimonials to capture the judges' interest.

Enjoy the show

This guide is by no means exhaustive, but if you plan in advance, develop compelling content, and manage your resources effectively, you will realise a significant payback on your MWC investment that will provide a boost to your business development and retention efforts for the rest of the year. Plan for flawless execution of your programmes and take time to walk through the halls, attend the speaking programme, and participate in networking events to learn what's new and trending in this ever-changing mobile space. ■

What is AT&T doing to keep its marketing approaches fresh? George Stenitzer talks to Cathy Coughlin, the company's chief marketing officer, about how she distinguishes between true behavioural change and passing fads

AT&T moves to digital-first marketing strategy to stay ahead of users' changing media habits



Cathy Coughlin: As marketers, our job is to ensure that we have a deep understanding of our customers and our company. Our job is to ensure that our brand — what we stand for and deliver on — is relevant, credible and valuable to customers

AT&T has shown a pattern of marketing experimentation. You've adopted new ways to reach consumers, such as creating webisodes for your Daybreak initiative and generating consumer interaction with Away We Happened. Why? What is AT&T doing now to keep its marketing approaches fresh?

Cathy Coughlin: At AT&T, we take a learn-and-innovate approach and design our marketing mix with a mobile, digital-first mindset. We want to take smart risks and find new ways to engage with consumers.

One of our latest examples is @SummerBreak, a youth entertainment reality series that follows the lives of a group of California teens in real time, exclusively on social media. It was created for this generation of media consumers, who are mobile-centric, socially connected and co-creators. To date, @SummerBreak has racked up over 40 million views on YouTube alone.

We also launched the Mobile Movement this year. It, too, documents the lives of young America. Its goal is to highlight how mobile innovation has impacted the lives of young people every day. It features our own customers on social media, telling stories about how their wireless devices and our service integrate into their lives. It also showcases their innovation as young entrepreneurs creating new apps and services across the country, every day.

One in three millennials know about the Mobile Movement and it has already delivered more than a billion impressions. What's more, we've seen solid upward movement for our brand among millenni-

als for favourability, willingness to recommend and intent to purchase.

How does AT&T's marketing stay ahead of users' changing media habits? How do you keep advertising effective when people use several screens at the same time?

Coughlin: At AT&T, we work hard to be in tune with both trending and established media-consumption habits. The key is to balance traditional forms of research with actual behavioural data to help distinguish between true behavioural change and passing fads.

What's not a fleeting trend is viewing content on multiple screens. The fact that people are viewing content simultaneously on tablets, smartphones, TVs and other devices gives us an opportunity to coordinate our advertising and marketing experiences across screens to deepen and amplify our messages.

AT&T is crowdsourcing product ideas such as AT&T Toggle. How did you get into crowdsourcing, and why is it important in marketing?

Coughlin: We've leveraged "Rethink Possible" to supercharge innovation inside our company. One of the ways is through The Innovation Pipeline, or TIP. It's the ultimate company suggestion box and possibly the largest corporate crowd-sourcing program worldwide, with more than 130,000 employees participating — including employees in 50 states and 54 countries.

TIP merges crowdsourcing with Silicon Valley's venture capital model to tap expertise and creative thinking within our company. It empowers and engages all employees, not just scientists in the labs. TIP led to the AT&T DriveMode app, which lets people who text you know that you're driving and can't text at the moment. To date, employees have submitted more than 28,000 ideas and we've committed some \$44 million.

You're leading AT&T's work to end texting while driving. Why did you get into this issue? Are you satisfied with the progress you're making so far?

Coughlin: In 2009, our chairman and CEO Randall Stephenson challenged us to get the word out on the dangers of texting and driving in a big way. He told us that we couldn't stand by while people used our service unsafely.

The result is our It Can Wait (ICW) campaign. We set three goals for ICW — raise awareness, change behaviour and save lives. We launched ICW first with our employees — we have nearly 250,000 employees and run one of the largest fleet operations in the world, so first and foremost, this was about protecting our own.

We then used the full force of AT&T to get the word out — through our employees, supply-chain partners, customers like insurance and car companies, and mayors, governors and police departments. To date, 2,500 organisations and more than 65,000 individuals have signed on as partners to get the word out.

We also introduced technology solutions, like our AT&T DriveMode app that lets folks know that you're driving and will get back to them when it's safe. That app has been downloaded 1.7 million times. The results are encouraging:

- 93% of teens and commuters surveyed are aware of the dangers of texting and driving;
- More than 5 million people have taken the pledge to never text and drive;
- Research on crash data from departments of transportation in Texas, Kentucky and other states suggests a correlation between ICW campaign activities and a reduction in crashes.

But the urge to text and drive is strong and there is more work to be done.

How can you make AT&T — the industry's most well-known brand — even more trusted and beloved?

Coughlin: We have a great opportunity in front of us. Think about it. There are two things you'll turn your car around and go home for — your wallet and your smartphone — and we're working to replace the wallet.

When I joined AT&T 35 years ago, we were a utility — the phone company. I couldn't have imagined the role we would play today in people's lives.

Our brand promise is "Mobilizing Your World", and everything we do is designed to deliver on that promise for our customers. That includes our investments in spectrum to fibre build-outs and our leadership in the internet of things including:

- Connecting cars for GM, Tesla, BMW and others;
- Connecting homes in 82 US markets and now for Telefónica;
- Connecting machines from GE locomotives to aircraft engines; and
- Delivering award-winning customer service.

Recently AT&T combined its business services and wireless units. Do you see an upside for marketing here?

Coughlin: Mobility is how businesses are doing business. It's disrupting industries, blurring lines between personal and work lives and allowing companies to redefine their business models, using mobile and cloud-based technology.

By combining our business services and mobile groups together, we'll accelerate the transformation of how we serve customers — from how we think about product development to how we go to market.

This new organisation under Ralph de la Vega serves more than 116 million mobile subscribers and more than 3.5 million business customers in 100 countries globally. It puts the best of AT&T together for our customers by delivering differentiated, best-in-class, highly secure mobile solutions worldwide — truly delivering on our brand promise of Mobilizing Your World — and now doing so in a way that is more seamless and integrated, exactly what customers are asking for.

How does AT&T partner with other telecoms operators to deliver what customers want? Are you looking for partners in specific markets now?

Coughlin: We serve 1,000 of the Fortune 1,000 companies in 100 countries across the globe, so it's important that we follow them wherever they do business. Our strategic partnerships and global SIM extend our network reach in key markets.

As a result, our network delivers IP-based services to customers in countries representing more than 99% of the world's economy. We're the only US operator offering roaming on the fastest speeds — 4G LTE — and we make it easier for business customers with M2M services to do business around the globe. For example, shipping companies can use our technology to closely monitor cargo over land and sea or by air with our global SIM.

You've been AT&T's CMO since 2007 — a remarkably long tenure for a CMO. What advice do you have for other CMOs on how to approach marketing?

Coughlin: As marketers, our job is to ensure that we have a deep understanding of our customers and our company. Our job is to ensure that our brand — what we stand for and deliver on — is relevant, credible and valuable to customers.

What are the keys to your success? What career advice would you offer to aspiring telecoms marketers?

Coughlin: I have been lucky to work for and around really great, smart leaders and have taken a lot of lessons away from them. A couple to point to — first and foremost, build the best possible team. Be very aware of what you bring to the table and look for people who are smart in ways that you are not.

Second, if you're given a chance to learn a new part of the business, grab it. At AT&T, I have been afforded that opportunity many times over — you'll be a better marketer if you take the chance to lead sales teams, technical groups or front-line business office people. You learn a lot about customers and what they need by having a different lens from jobs outside of marketing.

And lastly, move with a sense of urgency. Rarely do we look back and think: "I wish we hadn't gone so fast."

You've put a lot of work into improving science, technology, engineering and maths (STEM) education for women. Why are you so passionate about this?

Coughlin: I think we should all be passionate about this. STEM jobs are among the fastest growing and highest-paying in the US and yet nearly two-thirds of companies have STEM vacancies due to lack of qualified applicants.

We need more men and women to pursue STEM degrees — the problem is especially acute with women who are earning only one in four STEM degrees. Research suggests that girls lose interest in math and science around the seventh grade [age 12 in US schools] — so it's a pipeline issue.

We have to do more to inspire girls — with support from parents and teachers — to pursue degrees and careers in STEM. And that's why AT&T has invested millions of dollars in STEM programmes with organisations like the Girls Scouts and Girls Who Code to develop a strong pipeline of talent for the future. ■

Hamadoun Touré, retiring at the end of December as the secretary-general of the International Telecommunication Union, sets a challenge for his successor, who takes over in January.

Interview by Alan Burkitt-Gray

Challenge for next head of ITU is to connect the world's four billion unconnected people



Hamadoun Touré: the Broadband Commission has been very successful in putting broadband on the political agenda. Now countries understand that broadband networks will be critical for their future socio-economic development — and perhaps even more for poor countries than for rich countries

The major challenge for the new secretary-general of the International Telecommunication Union is to connect the billions of people who are still unconnected to the internet.

There are four billion of them, says Hamadoun Touré, who has led the ITU for eight years. Touré's second term of office closes at the end of 2014, and the new secretary-general, elected by the ITU's plenipotentiary conference in South Korea, is Houlin Zhao of China: see separate interview.

The triumph of Touré's term was the Broadband Commission, which he set up with Irina Bokova, the secretary-general of Unesco, the educational and cultural arm of the United Nations. Touré likes to boast that the ITU — originally the International Telegraph Union — is the UN's oldest agency, predating the United Nations itself by almost 80 years.

With the aid of Bokova and two distinguished co-chairs, Carlos Slim of América Móvil and Paul Kagame, president of Rwanda, Touré has helped to

raise the political world's awareness of the economic benefits of broadband.

Development goals

In 2000, the UN announced its Millennium Development Goals — targets that the world should achieve by 2015. No one back in 2000 seems to have considered that broadband had any relevance to a list of targets for the world that included the eradication of poverty and hunger, the achievement of universal primary education and a reduction in child mortality.

Touré, born in Mali, knew better. A former satellite engineer who had worked for Intelsat and other companies, he had been director of the ITU's Telecommunication Development Bureau since 1998 and led it until becoming director general at the beginning of 2007.

It took him three years, until May 2010, to set up the Broadband Commission — a group of hugely influential people from across the telecoms, cultural and political world, including Sunil Bharti Mittal

of Bharti Airtel, César Alierta of Telefónica, Denis O'Brien of Digicel, Sun Yafang of Huawei, John Chambers of Cisco, Hans Vestberg of Ericsson, Anne Bouverot of the GSM Association and former European Commissioner Neelie Kroes.

"One of the key achievements of the Broadband Commission is that it set up an advocacy group," says Touré. "I think that this has been very successful in putting broadband on the political agenda."

When the Broadband Commission was set up only four years ago "the major task was to try and highlight the importance of broadband everywhere", he says. He wanted to get politicians to understand the importance of information and communications technologies — ICTs — and link them with the UN's first 2015 development agenda.

That is still a key role for the ITU, he notes. But today "countries understand that broadband networks will be critical for their future socio-economic development — and perhaps even more for poor countries than for rich countries".

There are some visionary countries. Touré cites Rwanda, whose President Kagame came to the ITU conference with an open letter from members of the Broadband Commission.

Connect the unconnected

"Developing countries cannot afford to remain on the sidelines, as the global digital revolution raises established knowledge economies into a dominant position," said the commissioners' letter. "Governments around the world must strive to connect the unconnected and to continue to invest in ICTs and digital e-skills as an engine of inclusion, economic growth and development."

It was, "a very forward-looking, visionary policy statement", says Touré. "He said make sure that ICT is at the very heart of the national agenda. Many countries are now putting that as part of their development strategy."

He's happy that "in many places broadband networks are being built", but has a warning: "By leaving it to the market alone it means it's not happening in the most cost-effective manner." Government and the private sector should "all understand their roles and they are complementary".

According to Touré, the plenipotentiary conference — the agency's top policy-making body, held every four years — "experienced an atmosphere of positive vibrations that have never been the case before". The three-week event, attended by 2,505 delegates from 171 countries, including 76 government ministers, 36 deputy ministers and 56 ambassadors, went smoothly. "It's unbelievable how people came together," says Touré. "All the issues of finance and public policy that are usually very controversial issues — we came to good compromises on all of them."

The handover to the new team was particularly smooth. "I'm proud of making the smoothest transition ever in the ITU," he says. That's because "four of the five people from my team have been elected or re-elected". It means "we've been working together for eight years — a fantastic eight years — so there is a really good continuity. The ITU has voted for continuity. I'm very proud of that."

The ITU meeting adopted its Connect 2020 vision: "That was the great objective of meeting here. We contributed to making sure that the remaining four billion people on the planet are connected by 2020. And it is affordable."

Technology is "a means to achieve the post-2015 development agenda", he says. The ITU is "calling on members to make sure that they put ICT there on the agenda", finally remedying the mistakes of 14 years ago when "ICTs were not referred to at all in the development goals agenda".

The ITU and the Broadband Commission "came later on to make the link", he adds: "We want to make sure the post-2015 development agenda, which is sustainable development, [recognises that] ICT is a tool for other sectors to achieve development goals."

Superhighways

What can the telecoms industry do to achieve the goals? Says Touré: "Creating the environment for the superhighways of the information society to be in place." The industry has "a great contribution to make".

At the ITU conference "it was appreciated that their job and the job of the international community are complementary — different but complementary. They need to work together," he says.

Is there a good business case for telecoms companies to help achieve development goals?

"They have to sit down around the table" with other players "to see how they can make sure there is revenue and good return on investment for all of them", he says. There needs to be "investment in infrastructure and in services and applications".

At the moment the approach to investment is flawed. "Broadband can be rolled out in the wealthiest part of town, wherever people are willing to pay a premium — and poorer communities would be left out," he warns.

But that is changing. "There are over 145 countries today that have a national broadband plan. That's a good number and I'm very proud of that." That's an achievement in "just the four years that the Broadband Commission has been put in place".

So what next? Touré remains in office until the end of the year, though he has already booked his flight back to his home country for the last few days in December. Does he have a job lined up? "Do you need a chauffeur?" he jokes.

"I came from business to the ITU and I've been challenging politicians that they need to create the right business environment and people will come. I'm going back to business again and putting in practice what I've been preaching," he says.

"I need to create tens of thousands of jobs in every country I'll be operating in — and that's my challenge. There is so much opportunity out there — particularly in the developing world. In Africa the return on investment is there. If you have a good project you will find the money for it."

Touré will be back to visit the ITU's headquarters in Geneva in a few months: 17 May has been the UN's annual World Telecommunication and Information Society Day since 2006. That's a few days after Global Telecoms Business holds its Innovation Summit and Innovation Awards dinner in London: we hope to see him there. ■

Houlin Zhao, elected unopposed to lead the International Telecommunication Union, believes the UN agency should widen its focus to encourage start-ups and entrepreneurial enterprises

ITU's new head plans to connect technology parks to share experiences in emerging markets

Houlin Zhao: High-tech parks have young entrepreneurs working for small and medium sized companies, but they are working in isolation. Connect them together and allow them to share ideas, proposals and lessons



The new secretary-general of the International Telecommunication Union plans to work to connect young entrepreneurs together in technology parks across Africa. The new leader of the world's oldest United Nations agency believes the ITU has a key role in enabling them to share knowledge and experience and thereby helping to drive development.

Houlin Zhao was elected unopposed for a four-year term to head the ITU at the agency's administrative conference in Busan, South Korea, in October. He will take over from the previous secretary-general, Hamadoun Touré, at the start of 2015.

The transition should be smooth: Zhao served as deputy secretary-general alongside Touré for their two four-year terms.

In particular he wants to continue the work of Touré's Broadband Commission, the select group of CEOs and industry leaders, senior policy-makers and government representatives, development experts and others who have driven a four-year campaign to educate the world's political leadership about why broadband matters.

Unanimous support

"There was unanimous support for the Broadband Commission" at the ITU conference, Zhao told Global Telecoms Business in an interview the day after his election. "It was a very, very successful initiative by Dr Touré and we want to continue the project. The initiative started by Dr Touré is highly appreciated by our members. People recognise Dr Touré's achievement. As deputy secretary-general of the ITU I worked very closely with him and he said to me to continue."

One of Zhao's first meetings at the conference after his election was with Paul Kagame, president of Rwanda and co-chair, with América Móvil's Carlos Slim, of the Broadband Commission.

"I am in consultation with many commission members, asking them to give me advice on what we should do." The meeting with Kagame was "to discuss the Commission with him and look for his guidance on how we can develop."

When it was set up in 2010, the Broadband Commission had a relatively short-term target, to bring the importance of broadband to the attention of the international political community and to relate broadband to the Millennium Development Goals set by the United Nations a decade earlier.

As Touré and others have pointed out, these targets set in 2000 completely ignored the relevance of broadband — though, to be fair, at the start of the millennium 3G spectrum was being licensed and phones were still being developed, and "always on" fixed broadband was still a novelty even in the world's rich countries.

Now there appears to be an emerging call for a Broadband Commission 2.0, to take account of technology changes in the past few years and to benefit from a clear acceptance by the political establishment that broadband is vital to social and economic development. "We are engaged with others to improve the ecosystem," says Zhao.

In his acceptance speech to the ITU conference the secretary-general elect said that Touré "has done his utmost to lead the ITU with many achievements. Over the last eight years, he and I have enjoyed working together in an excellent relationship. He is a great son of Africa and my life friend and brother."

And, says Zhao, the conference endorsed the ITU's existing strategies and expressed its support for a strong ITU. "I believe the ITU will continue to further success and today the ICT and telecoms industries welcome these challenges."

Anniversary year

Zhao becomes secretary-general at the start of what will be the ITU's 150th anniversary year. The organisation was founded as the International Telegraph Union in Paris in 1865 — just a few years after the first successful transatlantic telegraph cable went into service and 11 years before Alexander Graham Bell patented his telephone.

"Over the last 150 years, ITU has demonstrated its ability to lead telecom/ICT developments in the world," Zhao told the conference in his acceptance speech.

But what are the challenges he will face as the ITU celebrates its first century and a half? In particular, he says, "we have to face the ever increasing request for new technology and new services". And "technology is moving very fast, with 3G, 4G and 5G all on the agenda".

But — coming back to the achievements and targets of the Broadband Commission — "we have to con-

Malcolm Johnson: takes over in January as deputy secretary-general when Zhao becomes secretary-general



nect people who are not connected yet” says Zhao. The industry needs to find “good cost effective solutions”, he adds.

“That’s the challenge from the technology point of view, but from the market point of view we have to have to find an open and good environment for investment and for services to serve people. But we have a lot of challenges, including competition and investment.”

Chinese-born Zhao is a 64-year-old telecoms engineer who was director of the ITU’s Telecommunication Standardization Bureau for eight years until he became deputy secretary-general. He worked for the TSB and its predecessor, the CCITT, from 1986 onwards. He’s a graduate of the Nanjing University of Posts and Telecommunications, and has an MSc in telematics from the UK’s University of Essex.

He wants to reassert the ITU’s role in technology. The ITU “is a specialised technical agency — this is our history, and still very much our core mandate, across all three sectors: radiocommunication, standardisation and development,” he says. “I believe that ITU must be positioned as the United Nations’ pre-eminent technical agency for worldwide cooperation in terms of spectrum harmonisation, global ICT standards that benefit the whole sector, and capacity building and knowledge sharing in every region.”

New management team

His first task “will be to convene the new management team”, he says. “We have five elected officials at ITU, including three new and two re-elected officials. We need to establish a good working relationship between the five of us for the coming four years.”

One of those colleagues is Malcolm Johnson of the UK, who was chosen as Zhao’s successor as deputy secretary-general in a contested election. Johnson won 104 votes from the 168 countries that voted. Johnson, who is 67, took over from Zhao at the start of 2007 as director of the Telecommunication Standardization Bureau.

“We need to establish a common vision and a common action plan to lead the Union,” says Zhao. The Busan conference approved strategic and financial plans. “We will be guided by the strategic plan.”

But that will mean efficiencies. “There’s no doubt that ITU will need to continue to make efforts to increase efficiency, and I will call for innovative ideas from managers and staff to make gains in productivity

and cut costs wherever possible,” he says. “Also, while our mandate remains, the tasks we need to undertake to fulfil that mandate are constantly evolving. When budgets are tight, we need to prioritise on the basis of what our members — governments, the private sector and academia — most need from us.”

The ITU needs “to increase our efficiency and transparency in order to gain the confidence of our members”, he says. “We have to gain their trust to increase their confidence in us.”

Zhao believes there is a “marvellous family spirit” in the ITU, and that this is reflected in the fact that he was unopposed in his bid to be secretary-general. The membership “is generally satisfied with the direction ITU has been taking, and with the competency of the management team, of which I have already been fortunate to be a member,” he adds.

The ITU is unusual among UN agencies in that companies in the telecoms industry can be members as well as governments. Zhao has led a move to add a new membership category, academia. “I think broadening our membership to include universities and academic institutions was a very positive step, and we have had lots of interest from around the world, with already more than 60 new academia members,” he says.

Global research

He would like the number increase to over 200 during his term of office, “creating a new, global research community that can empower young people wherever they live, around the world,” he says. “For me, this is a great way of engaging talented young researchers and students in the vital work of ITU, and we will continue to promote this opportunity very actively under my leadership.”

He says: “I would like to encourage SMEs to join us. In particular, we need to bring young entrepreneurs from developing countries into the ITU fold.”

Zhao believes “that world-class technical innovation is not always coming from industrialised nations, nor from the biggest companies”. Because networks allow for collaboration, “anyone with a good idea can be empowered to make that idea a reality”, he says. “That means even tiny start-ups in the remotest corners of the world can come up with ‘the next big thing’.”

That’s behind his proposal to link the high-technology parks that already exist in many parts of the developing world. “Many developing countries have a very dynamic strategy for development,” he says. High-tech parks have young entrepreneurs working for small and medium sized companies, but they are working in isolation.

“Quite a number of these high-tech parks do not have good access to the others, and do not know what their colleagues in other countries or even in other high-tech parks in the same country are doing.”

Connect them together, he says. “Allow them to share ideas, proposals and lessons. They would become aware of their weaknesses and try to find ways to improve themselves quickly and that would make them stronger. I’d like to encourage ITU members to find a platform for these people to come together.”

Such projects would be “good for them, good for the country, good for our society. I would like to do that.” ■

Operators looking to enter new markets are relying on wholesale providers to bring them new technologies, a global footprint and the efficiencies of scale

Beyond capacity: wholesale providers step up to cloud, quality and innovation opportunities

Quintin Lew: We've opened up our asset base to support all manner of customers, whether with fibre in local markets across the globe, wireless in the US or the IP backbone to connect it all globally



Operators across the globe are looking to enter new markets with new services but for many the barriers to entry are constraining. Operators around the globe are challenged in terms of their geographic footprint, their existing expertise and the resources available to invest in new technologies and platforms.

That creates an opportunity for wholesale network providers to expand their portfolios beyond capacity and into these new areas.

“Capacity is still a key component of our strategy but we’ve made available our entire portfolio of wireline, wireless, cloud and security solutions to support our customers around the globe,” says Quintin Lew, the senior vice president of marketing for Verizon Global Wholesale, the wholesale division of Verizon Communications. “We’ve opened up our asset base to support all manner of customers, whether with fibre in local markets across the globe, wireless in the US or the IP backbone to connect it all globally.”

A wholesale provider can be a natural supplier of these types of service to other operators. “Wholesale is a viable means to do this,” Lew explains. “We don’t have to provide an end-to-end solution in all cases; we’re here to fill in the gaps our customers may have. It’s about the layers and the solution sets that customers don’t want to specialise in — our customers don’t necessarily have the ability or desire to pull in all the pieces not only geographically but on an applications basis.”

Verizon has been working for several years to develop the expertise and capabilities necessary to support operator customers. “We’ve added a number of different assets to enable this including our acquisi-

tions of Terremark for cloud, Cybertrust for security and Hughes Telematics for M2M,” says Lew.

“More recently we’ve added CDN capability with our acquisition of EdgeCast. We also pull in other leading solution providers to enable our customers to grow to new layers of the market. From transport to the application layer we have tools available.”

Even so, transport remains at the core of Verizon Global Wholesale, with ethernet an increasingly attractive proposition. In the US, Transbeam is a national provider of managed data, voice, 4G wireless, wifi configuration and installation, IT and broadband connectivity for events, all over a privately owned next-generation network.

“Verizon’s coverage is expansive and that’s the clear reason for going with them,” says Marc Sellouk, the company’s chief executive. “They are certainly in more buildings than many other providers out there. In addition, they have best-of-breed offerings and we believe their SLAs are superior.”

That has resulted in a long relationship between the two companies. “We’ve been in business for 18 years and have evolved from the days when high-speed internet meant 56 kilobits per second,” says Sellouk. “We’ve worked with Verizon for about 16 years and use Verizon’s Optical Networking and Transparent LAN services. We’re about to embark on roll-out of additional ethernet products, such as Ethernet Virtual Private Line (EVPL), as well as Verizon Private IP service.”

Lew acknowledges that traditional services make up the major part of Verizon’s wholesale business but emphasises that being able to offer the entire portfolio is important. “The most obvious services are transport and capacity but those come in a number of forms,” he says. “If a customer wants fibre, wireless and IP we can provide them. Our biggest growth engine is our ethernet services — we feel we’re an industry leader.”

Sellouk sees uninterrupted growth putting continued pressure on geographic coverage. “We’re certainly going to need more coverage geographically,” he adds. “As our client demand grows we’re going to need more coverage across the country and certainly Verizon has the backbone for us. Fifty and 100 megabit as well as gigabit circuits are daily requirements. Ethernet is Transbeam’s signature product, with customers relying on this service for their high-bandwidth needs. We used to sell a gigabit circuit to very large enterprises and now it’s for SMEs, that’s very exciting.”

Although providers like Transbeam are in the midst of a storm of growth in demand, for Lew, the market potential extends far beyond provision of wholesale network capacity.



AVIANET

Avianet: synergies with Verizon for expertise and market intelligence



KDDI

KDDI: Verizon extends services to customers beyond own footprint



transbeam

Transbeam: about to embark on roll-out of additional ethernet products

“Basic access is what has driven our revenue but we will see more and more IP, cloud and mobility driving revenue in the future,” says Lew. “Of course, it also enables access to the cloud. Access to mission-critical applications is what we see as the end state. All the tools we have enable our customers to stitch together and create the solution they need. Verizon obviously has the scale and resources to test some of these new solutions and then bring them to smaller operators.”

Avianet, based in Germany, is a specialised IT services and solutions provider that supports airlines and other multinational clients at more than 150 locations across the globe. Like any other globally distributed business sector, the aviation industry faces a series of challenges

in adapting to the pace of new IT trends at the same time as addressing the pressures to cut costs but still achieve maximum business continuity to be successful in a highly competitive industry.

“Avianet has carefully designed and developed its aviation industry specific A-Cloud platform, based on the existing infrastructure of its strategic provider Verizon,” says Arshad Mughal, the general manager of Avianet. “Customers can make use of zero capex IT investments and have transparent and known costs for their whole IT infrastructure by taking advantage of the pay-per-use model of Avianet A-Cloud.”

“Due to our strategic business relationship, both Verizon and Avianet are benefitting from the developed synergies across each other’s expertise and market intelligence,” says Mughal. “With a close collaboration between both companies, we have integrated supportive solutions to each other’s portfolio.”

Avianet wants to offer further customised services and solutions to its customers. “We are closely working with Verizon to keep up with new features and developments which we can provide to our aviation customers,” adds Mughal.

Lew sees Verizon’s role as enabling customers to both do things they couldn’t do before and to accelerate their time to market. “We’re enabling them to get into areas they probably wouldn’t want to get into unless they’re already specialised in those,” he says.

“It’s very difficult to make investments in building a business around cloud, for example. Customers have to adapt their business processes and create the required back office systems to support operating in a new business model.”

Purchasing a cloud service from third-party provider such as Verizon enables these customers to get into that business faster and more cost effec-

tively by making use of the back-office support we have already established.

“We’re best known as a big company that builds everything to an extremely high degree of resilience but we also are flexible and want to be first to market,” Lew adds. “That gives us the opportunity to test something while we’re building it. It’s exciting but sensible because we would rather learn and fail fast rather than invest for 12-18 months and find we’ve missed the market.”

Another operator customer of Verizon’s is Japanese operator KDDI which uses MPLS and layer two ethernet access into MPLS throughout the US and Europe.

“Working with Verizon and its MPLS offerings enables us to greatly expand our coverage and extend services to our customers well beyond where we could purely on our own,” says Tatsuya Hamada, the general manager of the global sales and marketing department of the Global ICT Business Division at KDDI.

“Verizon’s coverage in the United States greatly complements our own access into the country. The option to provide our customers with layer-two local access in many areas is a great added bonus as Japanese customers are very accustomed to getting this type of access in Japan — now we can do this for them in the US as well.

“We make use of Verizon’s capacity in Europe, too, which only strengthens the collaboration for us,” adds Hamada. “The human element of Verizon’s international team makes it easy for us to get managerial, operational and sales support where and when we need it. Our upper managements in both companies have used this to create strong relationships at a very high corporate level. At the same time, working closely with Verizon provides us with considerable operational and cost benefits.”

Even with well-established IP services, Hamada sees room to differentiate on service. “Our commitment to our customers is that our operational quality will be the very best possible,” he says. “This is not always easy as Japanese customers can be very particular about how their services are provided. We work closely with carriers around the world to ensure they live up to our, and our customers’, expectations.”

Looking ahead, KDDI is rolling out cloud services and Verizon will support some of that activity. “We are currently rolling out our own global cloud service,” reveals Hamada. “We are looking to Verizon to assist us in connecting customers requiring private and secure cloud connections through our networks.”

For Lew creation of new revenue streams both for Verizon and its customers is a critical goal. “We can’t live in the old world where we have a lot of legacy revenue, it’s vital for us to generate new revenue streams,” he says. “The challenge today is to create new profitable revenues that grow faster than the decline of old revenue. If we can make use of all our assets it will be a great opportunity for us to create those new revenue streams.”

“We’re able to scale up to meet the requirements of our customers,” adds Lew. “Our customers can order without going into a complex system of having multiple hand offs within Verizon. Our services are based on having as little touch as possible which lets more and more customers enter the system and allows us to deliver an efficient model.” ■

Iridium's new fleet of satellites will provide second-by-second coverage of aircraft globally, says CEO Matt Desch. But he's also planning to earn millions from m2m and other apps

Iridium to provide global tracking of aircraft as new satellites go into service from 2015

Matt Desch: Iridium will generate significant operating margins and very high cash flows from its global network of satellites



When Malaysia Airlines MH370 disappeared in March 2014, it was a surprise to most travellers that there is no way of tracking even the most modern aircraft throughout a flight. Air traffic control ensures that aircraft stay on track, don't collide and land in the right place — but only over the busiest parts of the world. And hardly at all over sea.

Leave Los Angeles on the way to Beijing or Tokyo and, within minutes, you are out of range and out of touch until you reach the Pacific coast of Japan. Flights from northern Europe to North America via the great circle route over Iceland and Greenland are tracked, but not those further south — between Miami and Madrid, say, or Rio and Paris.

Head south from the Mediterranean and, once you pass the north African coast, you're pretty much on your own until you reach the coastal regions of west Africa or even further. Across the Indian Ocean there's no contact between the east African coast and India, Malaysia or Australia.

Matt Desch has a solution, which is due to start going into service from the middle of 2015. A Bell Labs veteran who went on to run Nortel's wireless networks division and then was CEO of Telcordia, Desch has been CEO of satellite telecoms company Iridium for the past eight years.

And the company is about to start launching a new fleet of satellites that will replace the first generation of Iridium satellites that date back to the late 1990s.

They will boost Iridium's commercial capabilities to deliver voice and data services in every part of the

world — but will also revolutionise aircraft safety and economics. "There shouldn't be any more missing aircraft," says Desch.

At the moment equipment in each airliner can signal its direction, speed and position, but it's effective only where there is coverage by air traffic control, "and that's only 10% of the world", says Desch. Iridium's new satellites will provide global coverage: "Aircraft will broadcast [their position] every second."

Messages will be sent using ADS-B equipment — standing for automatic dependent surveillance, broadcast — that will be fitted into each aircraft and will work with Iridium — or local air traffic control services when they are in range.

"Every aircraft flying into Europe by 2018 will have to have ADS-B," says Desch. The US deadline is 2020.

There will be economic benefits, too, he says. With accurate tracking over remote areas, aircraft will be able to fly closer together on more direct long-haul routes, "and save billions of dollars in fuel".

Iridium will be offering the service in a joint venture, called Aireon, with Nav Canada, the Canadian national air traffic control service, and those of Denmark, Ireland and Italy. Tracking will be offered free of charge to airlines that don't subscribe to the commercial service, says Desch. "We will provide tracking data about [missing] aircraft to an official source," he explains.

But aircraft tracking is an additional spin-off of what will be a wholesale replacement of Iridium's first-generation satellites, most of which date back to the 1990s. "We have about four to five years left" of the original design, says Desch, "and they continue to operate as designed". They have survived "well beyond what anyone thought and they have supported incredible growth", he adds.

Desch was hired back in 2006 to kick off the plan to renew the system. More than that: he had to renew the finances and the backing for the project. The Iridium Next satellites "will be able to support millions of customers", he says. And they are poised to generate lots of cash for Iridium.

"All the fund-raising is behind us. With the cash flow we're generating today and the money we have, we have a fully financed plan to create Iridium Next." By 2018, the major capital expenditure will be complete and the company will need to spend less than \$30 million a year for the next decade or so.

"We will have significant cash flow from 2018, not just from the extra growth but also from new entities." Iridium will "generate significant operating margins and very high cash flows".

The timing is right, he believes: the move to Iridium Next comes just as telecoms operators worldwide are looking for truly global coverage for machine-to-machine and tracking services.

“Part of the secret of our success is that we are a wholesale provider”, with more than 300 technology and telecoms partners, says Desch. He names avionics companies such as Honeywell and Rockwell, but also telecoms operators such as Telstra and KDDI. “There are a number [of operators] around the world that take us to market in their local geography,” he says. “Many of the larger companies realise that satellite is not just a niche service, particularly in machine-to-machine but in other areas where companies want to go beyond their boundaries. We are going to see more and more of that.”

There are significant opportunities in developing markets, he adds. “A shipping container or a truck tracked through Europe will eventually move into more remote locations and enterprises will still need to track their assets.”

Iridium is “most active in Asia”, he says, noting that China and south-east Asia are particularly interesting. “There is a lot of activity in Russia, which is a new market for us. And there’s a lot in South America.”

Telecoms operators “are increasingly trying to provide global enterprise services with end-to-end support for corporate entities” and machine-to-machine is a favourite topic for their attention. Operators are wanting to offer “applications that go beyond their networks”.

Take the increasingly attractive market for connected cars, for example. “Most applications are focused on terrestrial coverage via cellphone.” But “customers will realise the frustration of going through dead spots and they will want the same services”.

And, like the aircraft tracking system that will be provided by Iridium Next, some of these will be safety-critical. If a car maker promises that emergency services will be called out the moment an airbag is triggered, what happens in an area without cellphone service? “Companies will need to provide immediate coverage even if your connected car is outside cellphone coverage,” says Desch.

Iridium already has “a device that allows your cellphone to work anywhere on the planet”, he adds: it connects to the satellite network and generates a small wifi hotspot that can be used, with an app, for voice and data communications. “We have Android or iOS apps and you can call anyone or text or send and receive email.”

It is “a great application for boaters who go beyond cellphone coverage”, says Desch, who uses the same device in his private plane. “It’s a safety feature. It has

an emergency button and will send a GPS location.” Rescuers can use the system to talk back.

The fastest growing application is with suppliers of heavy equipment that is used in remote places. “These are million-dollar devices and connectivity is critical.”

Among other Iridium devices are a push-to-talk radio for emergency services, the military and remote construction teams. “We’re seeing this integrated with terrestrial public safety networks, which still don’t offer 100% geographical coverage. Our system can inter-work with them, and the dispatcher doesn’t know.”

A Dnepr rocket — a Russian design from the Cold War for intercontinental nuclear missiles — will launch the first two Iridium Next satellites in mid-2015 from a base near Yasny, 2,000 kilometres east of Moscow. The launch programme will then move to the Vandenberg US air force base in California, from which SpaceX will launch the next 70, in seven batches of 10, from late 2015.

As each new satellite is launched, it will replace one of the ageing first fleet. “The network will be completely replaced from 2015 to the second half of 2017,” says Desch. “The new satellites will provide seamless connections to all our 750,000 subscribers — and there will be a million by the time we have our complete new network.”

Back in the 1990s, Iridium was a project of mobile phone pioneer Motorola, from a team that never imagined a day would come when there would be almost universal coverage of the world’s populated areas with cellular networks.

It was a cellphone network in the sky, a grid of low-orbit satellites that cover every square kilometre of the world’s surface — including those regions in the far north or far south that are out of range of conventional satellites.

The new satellites will be “much more powerful, using technology that is today’s rather than from the mid-1990s”, he says. “They will have more capacity, and a higher speed service. Capacity will go up a factor of five or 10 from what it is today.”

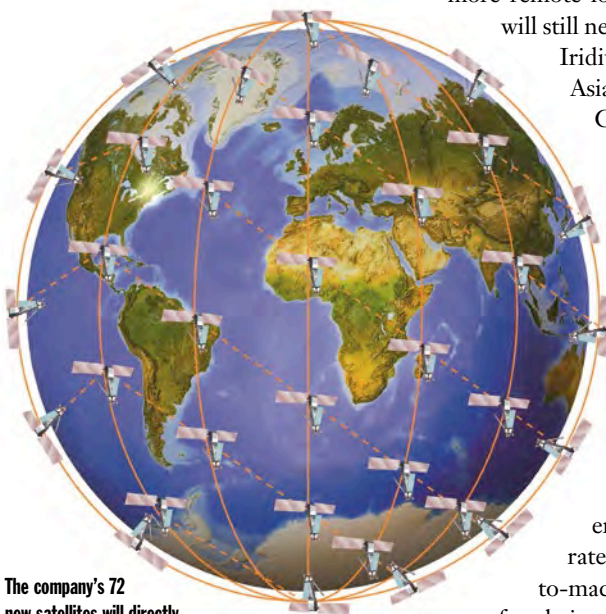
The original plan was for a grid of 77 satellites plus some in-orbit spares: the atomic number of the element is iridium, so the name is a pun, albeit one that is obscure to non-scientists. But before launch Motorola engineers cut the number to 66, while still achieving global service.

Traffic is routed from one satellite to another, so the mesh network does not need a global system of ground stations.

The Iridium Next fleet of 72 will use also 66 in service at any time, with six in-orbit spares, and will gradually offer the portfolio of new services on top of the classic Iridium connections.

“We’ve been very successful at creating a business around the extra space,” says Desch. More than half the traffic is now data, he says, “and most of that is machine-to-machine for moving or fixed connections”, using modems the size of a small coin.

It’s not broadband by today’s standards: “up to 1.5 megabits on average for maritime and terrestrial services”, says Desch. But if you’re on a plane crossing the ocean, or a truck in the Sahara, or a construction site in Brazil, you may well be grateful. ■



The company’s 72 new satellites will directly replace all of Iridium’s existing craft, in service since the 1990s

Enrique Blanco, global CTO of Telefónica, is one of the world's leading proponents of network functions virtualisation. He tells Alan Burkitt-Gray that the first NFV services will be tried out with Brazilian customers in 2015

Telefónica's virtualisation champion Enrique Blanco plans to start Brazil consumer services in early 2015



Enrique Blanco: In the first quarter of 2015 we will launch our virtual customer premises equipment to users in Brazil

By early 2015 some of Telefónica's fixed residential customers in Brazil will be receiving virtualised network services. In what is the beginning of a major transformation across Telefónica, the company plans to replace customer premises equipment with the virtualised equivalent hosted in the network.

At first the company will be trying out the technology, in association with NEC of Japan, the group's partner in developing the virtualised customer premises equipment.

Says Telefónica's global CTO, Enrique Blanco: "We now have the final software approach and we can say that in the first quarter of 2015 we will launch the virtual CPE to our customers in Brazil. We will be doing the concept testing and then we will be launching."

A full-scale launch will be "in the next year or so", he says. "This is the first level of virtualisation that Telefónica will be launching." The idea is to reduce costs by simplifying equipment in customers' premises, "because we can define services in the network, not in the customers' equipment".

That means services will be transportable. If Telefónica provides a particular service in your own home, you will, says Blanco, be able to use it even when visiting friends or family. "You are not dependent on equipment in your home."

Blanco is one of the industry's leading supporters of network functions virtualisation — NFV — and the cloud. "AT&T and Telefónica are the two big operators pushing the industry. The rest are waiting," he says. Indeed, he adds, Telefónica has the bigger challenge when it comes to virtualising services, particularly on the mobile side, as it has customers across the world from Chile to Germany. AT&T's mobile and consumer business is confined to the US.

Blanco joined Telefónica 30 years ago, when the company's activities were restricted to Spain. Now the company has fixed and mobile operations in Latin America. In Europe, it owns the O2 businesses in Germany and the UK.

Behind all this is Telefónica's drive for fibre-to-the-home, which will allow it to deliver video to its customers.

"This is Telefónica's first approach to virtualisation in the home. We will be launching this in Brazil in January. We have been working with NEC for 24 months. This is a very long-term project."

First step in cloud

And it is "just the first step in our cloud approach", says Blanco. The company is working hard at virtualising the home location register, the HLR, that is at the heart of all mobile operations.

He recognises that big, traditional vendors "are not very happy" with Telefónica's approach, he says. "They understand that we are pushing very hard to define an open software solution for network virtualisation."

He gives an example of why they may be unhappy. Today "the IT guys are working on the virtualisation of the servers, the traditional IT infrastructure", he says. "Take IMS, the platform that today supports voice over IP. If you have FTTH from Telefónica,

you have a fibre-connected phone. When you are talking on your fixed device, you are using specific hardware and software that is managed by Ericsson.”

The idea behind virtualisation is that functions in the future will not be tied to specific hardware, but will be provided by capacity in data centres, with the capability defined anywhere “in Brazil, Spain or whatever”, he says.

“You can define specific software and a typical server that is running. You can define these virtual machines in Brazil and use [the service] in Argentina. You are using an analytic approach to define specific software and hardware.”

That means the operator is no longer locked in to one equipment vendor for a particular service, because virtualised services run on standard servers. The benefits to Telefónica include flexibility, and also a reduction in capital expenditure.

Which vendors is Telefónica working with on these projects? “On network functions virtualisation, we are working with Ericsson, Huawei and Alcatel-Lucent. And we are trying to push Nokia, because Nokia is one of our main vendors in radio.”

On the server side, the company is working “very closely with the people at HP, we are working with the people at Intel and we are trying to see how the people at NEC can cooperate.” On virtualisation of cloud services, “we are working with the people at HP and at Alcatel-Lucent, who have a very good approach to cloud services.”

Vendors are all working towards virtualisation, he says. “Over the next three to five years all the main vendors will offer solutions in the virtualised world, but we cannot wait. If we wait, nothing happens. We need to push, and we need to send very clear messages to the industry: we are going to virtualise.”

Telefónica’s target is that by 2017 the company will virtualise up to 30% of its total network — and the company will be spending 30% of its capex budget on virtualisation.

Virtualising the HLR is another central plank of Blanco’s virtualisation programme. “Let me explain. Today when you are in the UK and you are using the O2 network, the network function knows where your device is.”

Across the group, Telefónica uses HLR systems from Ericsson and Nokia, he adds. “Each country has its own HLR.” But when an operator buys an HLR, it needs to tell the vendor how many customers it will be serving. “You need to deploy, and you need to duplicate, and you need to host and maintain the capabilities of the HLR according to the size of the capability, country by country.”

One HLR for all of Europe

Over the next three years Telefónica has a plan to virtualise its HLRs. “The hardware that we are installing is not proprietary hardware.” It is simply part of the data centre “on rack servers with a communication layer” and Telefónica will be able to host “the HLR capabilities for all of Europe on a single site”.

There will no longer be a need to host separate HLR facilities in each country, says Blanco. “This is efficient because you can host everything at a single point, minimising the capital expenditure.”

It has to be built to carrier class, of course: if the HLR goes down, the network goes down, as Telefónica remembers from July 2012. Two weeks before the start of the London Olympics, millions of O2 customers in the UK lost service because of a failure in the HLR. A second failure was reported in October 2012.

Telefónica is testing the technology to produce a carrier-class virtualised HLR. “We need to work very hard,” says Blanco. “Customers do not understand if you do not give the right service.”

One of the challenges with the HLR project is latency: clearly, if services are provided from a data centre in a different country, there will be some signal delay which may affect the quality of service.

But it will work out cheaper for the company “because we can buy by region not by country”, he adds. “Today if you need to grow the number of customers, you need to define with the HLR vendor how many customers it can handle.” That will take time — three to four months is typical, he says.

In the future, with virtualised solutions, if you need to grow by 1.5 million customers in the UK, he says, “you can do this in no more than one week”, using the capabilities you have in the data centre. “You have the software and you need only to buy new licences, virtual licences. It is easier to manage, it is easier to grow.”

Telefónica’s European virtualised HLR services will be based in the company’s Alcalá data centre just outside Madrid. For Latin America, the company will use data centres in Argentina and Brazil as well as in Miami, Florida.

Why Miami? It has excellent submarine cable connections to central America, Brazil and the rest of Latin America, “and you can connect Miami with Europe through the submarine cables”, says Blanco. “We have huge capability in transport.”

Virtualised radio access network

Blanco gives a further example of the company’s virtualisation ideas. He is running an active programme to move most of the equipment in the radio access network to central servers.

The company’s next step will be the cloud-based radio-access network — or C-RAN. “What does this mean? On the roof there is only the antennas,” he says. The current model for base stations has an antenna connected to a block of equipment on the same site, costing money to install and maintain and using power.

In future, most of the equipment will be in a data centre, which will be connected to “20, 30 or 40 antennas” in the neighbourhood. This will reduce the amount of space needed on each roof as well as the power consumption of the radio network.

Ultimately, though, the hardware will be easier to use and replace, and power consumption will be lower, “and the quality for customers will be higher”. The technology will permit the adoption of small cells, but the architecture of radio networks will be very different from today’s approach.

But it’s not just the architecture of radio networks that will change if Blanco’s vision is to be realised: the whole of the telecoms industry is considering radical changes to the way it does things. Blanco is leading Telefónica into this new world in order to assess the potential benefits. ■

Turkcell's CEO Süreyya Ciliz explains how the company's policy to address carefully segmented markets justifies its development of its own smartphone

New world for Turkcell as company targets market segments with own phone and m-health services



Süreyya Ciliz: How do we create the new online services so that we create value for customers and value for us?

There's a new world opening up, enthuses Süreyya Ciliz, the CEO of Turkcell. And Moore's law — the 50-year-prediction about the size and price of micro-electronics — is to blame.

"We see a new world of mobile and cloud and devices connecting into a mobile network," says Ciliz, who has run Turkcell for eight years in January 2015.

"It's because of Moore's law. Components are getting smaller and they are everywhere." It means that it has become possible to put mobile connections "everywhere at any time", he adds.

"This opens up this new world. It is impacting heavily on the media. It's changing how field sales forces execute. It impacts retailers."

Ciliz is at ease talking about micro technology. He spent a decade working for Microsoft, first in his native Turkey and then for seven years in the US.

Earlier in his career he had studied in the US, getting a first degree in computer engineering from the University of Michigan and an MBA from Harvard. He went on to found a company in the US before joining Microsoft.

Turkcell was the first mobile operator in Turkey, having been set up in 1994. Six years later it became

the first Turkish company to be listed on the New York Stock Exchange.

"We are investing each year, getting ready for this new world," says Ciliz. This new world consists of "mobile first, cloud first", all connected via a fibre backbone. "We are enabling this new world," he says. The company is building "a new architecture", which is designed around the needs of corporate customers.

There are "three layers in this new operating architecture", he explains. At the top, there are "devices everywhere", including smart TVs, personal computers, hand-held devices, smartphones, sensors and "machine-to-machine devices everywhere".

And this world is being embraced enthusiastically in Turkey, he adds. "Data traffic in Turkey has increased 200-fold in five years," he notes. "It's now doubling every years. How do we put in the capacity to meet this demand? It's out number-one priority."

The second question is: "How do we create the new online services so that we create value for customers and value for us?" he asks.

"Turkcell is really in the process of evolving from being just a GSM company to becoming a communications and technology company."

Turkcell wants to be different from most mobile and fixed operators, which are becoming transport systems for over-the-top content and service providers. "We are not willing to surrender the market to the OTTs," he says.

For that reason Turkcell has developed its own range of services which it sells to its customers. "We offer our own messaging, voice over IP, mobile marketing, mobile health and mobile finance," he says.

The company has just introduced its own IPTV service, for both mobile and fixed customers.

And it even has its own smartphone, the Turkcell T50. "It's the best-selling phone in the Turkish market," says Ciliz. "We expect smartphone penetration to be around 40% in Turkey."

The phone "was designed by Turkish engineers working with our partners." Who are they? He refuses to name names. "There is one manufacturing partner in Turkey and one manufacturing partner in China."

Can he name them? "I'd rather not," he repeats. "We want to keep flexible, and to change the manufacturing partners if we have to. We don't want to be fixed to one manufacturer."

Why, given that there is a global market for smartphones — with many appearing in the stores at remarkably low prices — does Turkcell feel the need for its own phone?

It's not notably cheaper than other leading smartphones on the market: one Istanbul online retailer is



The Turkcell T50 smartphone, designed by its own engineers with apps targeted to the Turkish market

offering it at the equivalent of around \$285, though Turkcell is offering it at about \$18 a month on 24-month contracts.

“We pay attention to performance, to software applications and to price,” says Ciliz. “This gives us a differential and enables us to move people to smartphones. We think that it has the performance of a product that is twice as expensive.”

It’s an Android phone, with “a lot of mobile apps that our customers use”, he adds. The company has sold over 1.8 million of the T50 so far, says Ciliz.

It’s all part of a programme started in the past five years, he explains. “We decide that in this new world, with mobile and the cloud and the network, we need to get closer to our customers, understand our customers better, and offer much finer, more granular segmentation.”

This policy applies both to consumers, which are split into sub-segments, and vertical corporate markets. “On the consumer side we focus on a number of groups, including professionals, young people, handicapped people, housewives and farmers. We want to deliver the newest computing platform to them all.”

And that includes “hardware, software and their connection to the cloud”, he says. “We can customise our offer for these segments, so our phones have large buttons for the elderly.” That large-button feature “is in the software layer of the T50”, he adds.

The variant for farmers includes data about where they are and what type of products they grow, “so that we can provide information that is specific to them”, he says. “We partner with experts and the Turkish agriculture ministry to provide information.” Farmers get detailed weather forecasts, including details of humidity and wind.

Turkcell justifies selling the T50 “because we don’t have the marketing cost of other phones”, he says. “And the Turkcell brand is respected, and we sell it through our exclusive channel.”

The T50 project is backed by government bodies in other ways, he adds: Turkey wants to see local high-technology industries develop, and it seems clear that making the T50 in Turkey is part of the scheme. Turkcell is working with the government to help develop the electronics industry in Turkey, says Ciliz.

Four years ago Nokia was the market leader in Turkey, he says. “We felt that the user experience wasn’t good, and we wanted a new generation of Android-based smartphones on the market.”

A key part of the project was to incorporate Turkish apps. “At first some vendors were not willing to cooperate with us on the apps side, but now they are more willing to do so,” he says.

The T50 is just one model in the Turkcell range. “Every year there are two new models.” When will the next one be? “I don’t want to give the timing right now, but the last one was launched in July 2014.”

The model is sold in other countries where Turkcell operates, Ciliz adds, but not outside. Turkcell has operations in a number of other countries, including Azerbaijan, Belarus, Georgia, Kazakhstan, Moldova and Ukraine, as well as in Northern Cyprus.

There are no plans to sell Turkcell-branded phones outside Turkcell’s own market, he repeats. “When you sell the product the brand is very important. You cannot underestimate the importance of the brand. The Turkcell T50 would be unknown elsewhere. In Turkey, it is very well known, and is recognised for its top quality.”

The company’s “technology partners are benefiting from our joint development,” he says. “They can take the hardware component, but what makes the phone special is the optimisation for our network and apps that are specific for the Turkcell market.”

Devices such as the T50 are key ingredients in Turkcell’s strategy, he suggests. “These developments are getting more important because of the segmented approach we have. For certain segments we have to get the right device. The key point is that Turkcell is focused on our customers at a more granular level and is doing new things not done before to benefit our customers and to create value for our customers.”

As an example, he explains that the company has developed a health-monitoring device. “Health is a new business for us, and the device enables the patient to send important information to doctors, relatives and medical call centres — and ambulance centres if necessary,” he explains.

It can measure five separate characteristics or conditions, including high blood pressure, arrhythmia, diabetes, asthma and chronic obstructive pulmonary disease. “Sensors automatically measure these and send the information to the data centres,” he says.

As part of the service, local hospitals in the countryside can use Turkcell-provided video to connect their patients to specialists in the cities.

“You can imagine someone sick in a village. We can connect the person immediately.”

It’s not only for rural areas, he adds. The service can provide “a quick connection between patients and doctors in other parts of the country. The video connection uses high-resolution tablets “with a good camera”, with the addition of software developed at Turkcell’s own technology centre to make the connection.

“In villages the tablet is used at the local health office. A nurse uses the device to send vital information in addition to using it for face-to-face video conferences.”

The project “was funded by medical centres” in Turkey, “and we are the technology partners”, he adds. ■

It's not just an message, says IDT's messaging chief Jonathon Linner. It's an message that offers users contextual information related to the message, and they can be a valuable source of revenue to mobile operators

The next generation of messaging takes users right to the restaurants, movie tickets and music sites



Jonathon Linner: Messaging is the single most important function on a phone. Now operators have to transform their offer, or they will lose important touchpoints with their customers

It's getting towards the end of the working day and you're wondering what to do in the evening. A text arrives from a friend: "Fancy Interstellar tonight? I should be out of the office by 6.30."

But that text is more than just 66 characters on your smartphone. The name of the movie is hyper-linked: click and your phone takes you to the schedules of local cinemas showing Interstellar — and, because your friend specified a time, all began a respectable interval after 6.30.

More than that, but if one of the timings is right for you both, a further click will take you to a ticket-buying site.

You text back: "I've just booked two tickets for the 8.30 showing. That gives us time for a quick Chinese before the movie."

Your friend receives two further hyperlinks embedded in her text from you: one showing the location of the cinema, the other showing a choice of Chinese restaurants in the area — because the technology recognises that by "quick Chinese" you mean "a quick Chinese meal".

And so, in a few text messages, your evening is not only agreed but also organised.

Will this lead to the revival of revenue from text messaging for mobile operators? This is what Jonathon Linner, head of IDT's messaging division, believes.

It's Linner's division that is behind all the technology — called IDT MagicWords — that inserts hyperlinks into those text messages.

With MagicWords, he says, "a mobile operator can run a competitive offer to WhatsApp and to the other over-the-top messaging guys and keep customers in their platform".

The point is, he adds, that IDT's white-labelled messaging service is better than what's already out there. In fact, he adds, it's possible to integrate traditional SMS messaging and WhatsApp or other OTT services into one box. "The user doesn't have to choose. We figure out which to use."

The crucial point, he says, is that operators are looking for ways to enhance their text-messaging service so that their customers keep using the in-house service rather than drifting off to the OTT providers, which take revenue away.

"Messaging can be the single most important function on a phone," says Linner. He, like many others, is talking less and less on their phones and using message services instead. "Even my voicemail now says 'send a text' rather than 'leave a message'," he adds.

"Now operators have to transform their offer, or they will lose important touchpoints with their customers." OTT providers are challenging operators for both voice and messaging. "If an operator doesn't do voice and doesn't do messaging, what does the operator actually have? It becomes just a transport mechanism."

And operators don't always provide the transport mechanism, he adds. "I have a \$200 a month bill for my phone. I am loyal to my phone and to the apps on it, but I don't use the phone for calling. I'm giving my operator money to send data, and most of the time I do that I'm on wifi. Where does that leave the carrier?"

He likens the position to the transformation AOL and other pioneering internet service providers went through in the early days. "At one point they were the internet and we went to places they sent us." Now we use ISPs simply as transport.

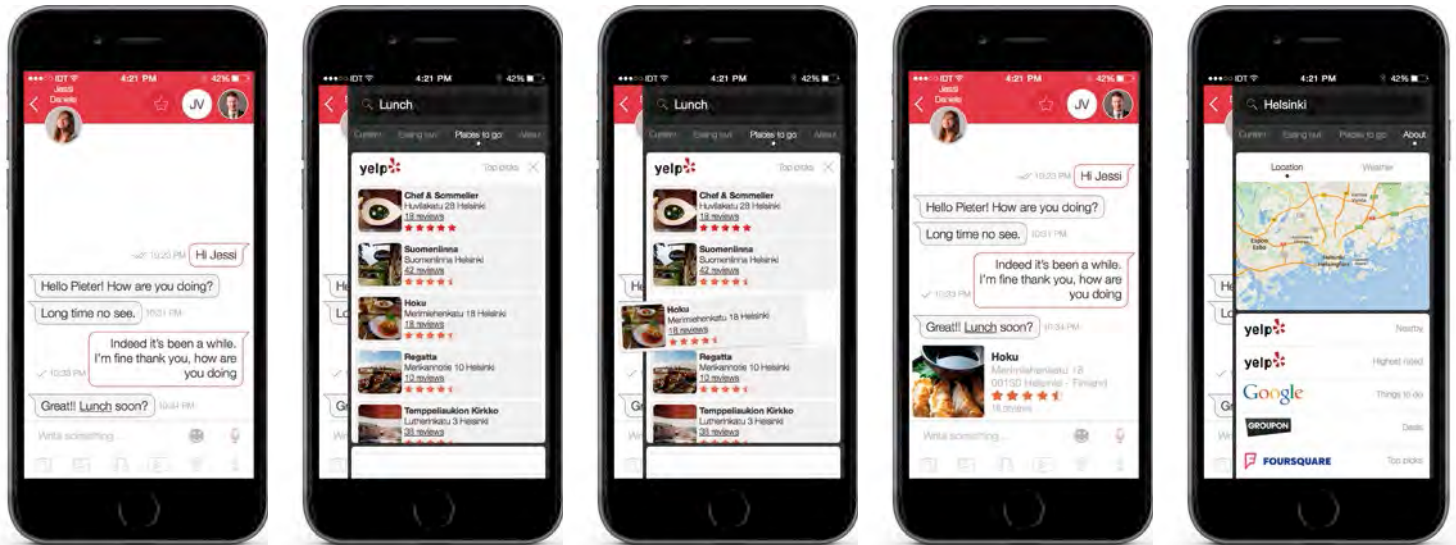
"Operators need to try to give customers reasons to use their service. They can still provide better services than the OTT providers, because they have access to information that no one else has.

IDT already provides its MagicWords messaging services to a number of operators worldwide. Linner says Vodafone India is a good market and adds SingTel's mobile offshoot in the Philippines. In the US, T-Mobile is a user.

Customers are generating a billion views a month, he says. Most operators use the MagicWords brand, but one uses the term "Buzzwords" instead.

IDT acquired the business, then called HD Messaging, along with the engineering team and Linner, the founder, in early 2014. "Now we have all the benefits of being in a big company along with all the benefits of being a start-up," he says.

"We have patented the system that understands the context of the messages," adds Linner, who has been a



MagicWords transforms the simple text message into rich content without leaving the message. Users can book a restaurant, or watch a video, inside the message window

leader of the messaging industry for around 15 years. That's how the IDT system can pick up on the name of a movie — as well as a person's location — and can link to theatrical schedules. And it understands the "Chinese" reference is to a restaurant.

But it can do more, says Linner. "If you receive a message about a new U2 album, the links can take you to recent tweets about the band, can give you U2's Wikipedia page, can connect to Spotify, and lots more. There can be 10 different apps inside one message — and the message can offer you tickets with one click," he says.

"This transforms the simple text message into very rich content without leaving the message. You can even be watching videos right inside the message window."

It saves time, he adds. "If you wanted to find out about the new album in the old way, going to a browser and typing in the name, it could be a 15-minute process to check Spotify, Twitter and all the other sources. But you probably wouldn't do all that. It's kind of hard and it takes too long."

The IDT messaging system, on the other hand, "takes me to all the content I might be interested in, without leaving the message. You can suggest a movie to a friend and get to the box office in less than five seconds, you can find show times, and buy tickets in less than 20 seconds. And then find you a restaurant, with a booking page and a plan of tables available.

"It's a machine that understands and figures out what's relevant — it's like having a PA who knows what you want without interrupting the messaging. The information should be at your fingertips."

Typically both sides of a message conversation have access to the technology, but that's not a requirement. Even if one party to a conversation just has legacy SMS, the other person can benefit from the IDT enhancements.

"The users like it," says Linner. "Customer satisfaction is very high, at 90%. Users love it, because there

is more information at their fingertips." As a result they're spending more time with the messaging application — which is good for operators. "And operators can get a revenue share for sales of tickets or music," he adds. "This is a great opportunity to make more money, and users like it."

IDT doesn't provide all this information itself for MagicWords, he emphasises. "For each location we have a number of data providers. We know what is the best source of information on tickets, what is the best restaurant guide. Our partners help us with that. Our goal is to figure out what is the best information. I might need it to show me sushi restaurants in London even if I've not in London."

Context is vital, he points out. "We add a secret sauce that allows us to understand the context intelligently." If someone uses the term "an evening with the bills", MagicWords should know from the context whether the person meant spending the next few hours writing cheques for the electricity, phone and water or having fun at a Buffalo Bills game. "Then MagicWords should take me to sites for times, tickets and jerseys. There has to be a very intelligent back end. We have to understand what you're talking about."

Linner, an American who once spent several years working in the UK, is a Liverpool FC fan "by proxy — my business partner introduced me to the team", he says. "If I use the term 'reds' in a message the system has to understand what I mean. Most technology couldn't do that."

Another example: if someone mentions "U2", they might be referring to the band, or be responding to a previous message which said "ILY".

Explains Linner: "We're trying to understand what you're doing. We're not trying to organise all the information on the net, but to provide you with five or 10 really relevant things. It's making life better. It's providing a more delightful experience, increasing customer satisfaction." ■

There's a huge potential market for tower companies in Africa, says Eaton Towers CEO Alan Harper. Each of a potential 150,000 towers could be worth \$150,000, he estimates

Eaton Towers set to triple in size following deal to buy Airtel masts in six African countries



Alan Harper: A reasonable price for a tower in Africa is in the region of \$150,000 to \$180,000

Eaton Towers has signed a deal that expands its reach from three African countries to a total of seven, and more than triples the number of towers that it will own and operate on behalf of mobile phone service providers.

Under the deal, signed in September, Eaton will buy more than 3,500 towers from Bharti Airtel, the Indian-owned operator, in six African countries. Airtel will be an anchor tenant with a 10-year contract.

But this is only the start, believes CEO Alan Harper. He estimates that the market will be 150,000 mobile phone towers across Africa's 56 nations. "Probably the majority of towers in Africa will be in independent hands in 12-24 months," he forecasts.

And, while he accepts that it can be hard to put a valuation on a tower, especially in a market where prices are rarely disclosed, he suggests that the price per tower is in the region of \$150,000 to \$180,000. "We would think that's a reasonable price."

Do the calculations and that implies that Africa's towers are worth up to \$25 billion.

Before the Airtel agreement, London-based Eaton was running around 1,500 towers in only three countries, says Harper: Ghana, Uganda and South Africa. The new deal will bring the total to 5,000 towers in seven countries.

It's "a transformational deal which gives Eaton Towers the most diversified tower portfolio across Africa", says Harper, who co-founded the company in 2008 with a number of other veterans of the mobile phone industry.

Co-founder Sanjiv Ahuja was CEO and COO of Orange from 2003 to 2007, after it had become part of France Telecom but before the French group had adopted Orange as its global name.

Another co-founder is Terry Rhodes, who co-founded Celtel as a pan-African mobile phone operator and helped to run it until Zain bought it for \$3.4 billion in 2005. Five years later Airtel bought most of Zain's African business for three times the price.

Harper himself spent six years in the late 1980s and early 1990s as strategy director for what became T-Mobile UK. He then joined Vodafone, where he was group strategy and new business director until 2007, and briefly managing director of Vodafone UK.

The three co-founders came together not long after. "Terry and I saw that Africa was an unaddressed opportunity. We have been running as a business for six years, but have been operational for just under four," says Harper.

And six years ago the very idea that operators should outsource their towers to independent companies was little short of revolutionary. Now, an increasing num-

ber of operators are signing deals with not only Eaton Towers but also companies such as American Tower, Crown Castle, Helios Towers Africa and IHS.

"I decided not to be in the operator business any more," recalls Harper of the time after he left Vodafone. He worked on a number of projects before deciding with his partners that "Africa presented an opportunity".

There were no tower companies in Africa six years ago, he notes, but he and his colleagues saw the opportunity.

Its first deal was with Vodafone Ghana in 2010, a couple of years after the government of Ghana had sold a 70% stake in its incumbent operator for \$910 million.

Ghana seems to have been the birthplace of the African tower industry. "We did a deal, Helios did a deal, also in Ghana, with Tigo," says Harper.

"We specifically decided to focus on Africa. At the time there was just one small independent tower company, in Nigeria." The rest of the continent was open to opportunity.

"All the first deals to buy towers were signed in 2010-11. Since then there have been a range of tower deals by ourselves and other companies. In the past 12-24 months the market has taken off," he says.

Why did it take so long — and why has the market changed? "At first all the operators were feeling their way. They were wondering who they wanted to do business with. Most operators did one or two deals and then sat down to see if they would get the benefits."

Airtel and MTN were among the leaders of the move to outsource towers. "They have done a lot of deals," says Harper. Etisalat in Nigeria and Vodafone have also tested the market. "It's become a serious part of the agenda," he adds. "They've seen the results and they've seen the benefits."

So what are the advantages of selling off your towers? After all, it's not something that is confined to Africa. In the US, Verizon Wireless is selling its towers — in a market where two tower companies, American Tower and Crown Castle have been established for 20 years, he notes.

What makes a company contemplate selling its towers depends on its position in the market, he says. "When a company has a strong market position, it sees owning towers as an advantage."

But there's a trend. Perhaps they are wary about selling because it will give their competitors access to the towers — but if they leave it too long perhaps the towers will not be worth as much, especially if some of their competitors move first.

And the market varies tremendously from country to country. Some governments have encouraged outsourcing towers as a way of stimulating compe-



A tower company in Africa has to take over all the running of the passive infrastructure: the generators, the batteries and the air-conditioning. Picture: Ericsson

“Everything we in Eaton Towers do, a mobile operator CEO could do, but it wouldn’t be their first priority. He doesn’t want to worry about the power grid and batteries.”

“When we buy a tower, we take over all the passive infrastructure on that site. We then run that. If the generator needs replacing, we replace it. We look after refuelling and security.”

Some tower companies in the US are regarded as real estate investment trusts, he notes with a smile. In Africa, it’s different: “Yes, a tower company is a property company, but also a logistics company and a power company. In the US the electricity grid works. In Uganda the grid works half the time on 75% of the sites, and on 25% of the sites there is no grid.”

Why haven’t large equipment vendors — many of which also offer outsourced services — diversified into towers? “It’s a different business,” says Harper. “They can package a capital sale, but running towers is about focus and expertise.”

And there’s another reason. Vendors “don’t want the balance sheet pressure” of owning lots of towers, he suggests. Essentially, “it’s not their business. It’s a different business.”

And it’s business, he says, that an increasing number of operator CEOs are happy to offload to someone else. “An operator CEO has 15 things to worry about. Everything we in Eaton Towers do, a mobile operator CEO could do, but it wouldn’t be their first priority. He doesn’t want to worry about the power grid and batteries.”

A regional managing director in Eaton has one priority: to keep the towers running on behalf of the customers.

“It is a very capital intensive business,” says Harper. Originally owned by its founders, Eaton Towers is majority owned by a \$3 billion private equity fund of Capital Group Private Markets with minority shareholders including a private equity fund advised by DPI. There is still a management shareholding.

“It’s very expensive to build a tower in most African countries. There’s a lot of investment in security and power.” He estimates the construction cost of a new tower to be between \$100,000 and \$150,000 each. “We’ve built towers in all three countries [where Eaton currently operates],” he says.

Where next? Perhaps buying more portfolios of towers, he suggests. “What are the advantages of buying rather than building? Speed to market, and an established customer base, with an anchor tenant.”

But the company is also looking at diversifying into in-building systems, something which has already started in developed markets. There is potential, he believes, in owning infrastructure in Africa’s shopping malls and hotels, for example, “trying to improve coverage where people are”.

And that’s what the market is all about — especially as in Africa, as elsewhere, demand for data means a growing demand for new sites. ■

tion and helping the market to develop; others are, as Harper says, “a bit slow and have not got round to it yet”.

Eaton Towers “has tried to build a portfolio” of towers across a number of countries — though, he points out, the company does not operate in Nigeria, where there are already independent tower operators. “We don’t want to be third or fourth in the market.”

Some countries and operators are just too small to be interesting, he suggests. “There needs to be a critical mass. If there are fewer than 500 towers it is difficult to make the economics work.” Sometimes tower companies are just not interested in smaller markets — or maybe the operators are asking too high a price.

The African tower business is very different from tower businesses in the US or Europe, says Harper — and perhaps that’s where companies such as Eaton have their advantage.

“In Africa the challenge is the power infrastructure, and some security issues,” he says. A tower company has to take over all the running of the passive infrastructure: not the electronics, but the generators, the batteries and the air-conditioning.

Bringing you the leaders of the industry... ...issue by issue

Here are just a few of our latest interviews, still available for you to read on our website. To read the interviews, go to www.globaltelecomsbusiness.com and select the 'Interviews' link at the top of the screen, or type the tinyurl.com code directly into your browser



Vittorio Colao,
CEO of Vodafone

<http://tinyurl.com/GTB-Colao>



Randall Stephenson,
chairman and CEO of AT&T

<http://tinyurl.com/GTB-Stephenson>



Dan Mead,
CEO of Verizon Wireless

<http://tinyurl.com/GTB-Mead>



Stéphane Richard,
CEO of Orange

<http://tinyurl.com/GTB-Richard>



Anne Bouverot,
director general of the GSMA

<http://tinyurl.com/GTB-Bouverot>

These are just five of the 150 interviews that Global Telecoms Business has carried out with industry leaders in the past few years. All of these are still

available via our website and on our free iPad edition. To download the iPad edition, go to <http://tinyurl.com/GTB-iPad>

Joe Garner, with a retail background, is the first head of the UK's last mile service, Openreach, to come from outside BT

Openreach boss at the top of a people business



Joe Garner: Looking at ways of driving up speed, but limited demand for fibre to the home so far

The new chief executive of Openreach, the UK's last-mile fixed network connector, is still new to the telecoms industry — but it's his job to deliver broadband as fast and as reliably as possibly on behalf of all the UK's fixed operators.

"I started at Procter & Gamble, including five years in Romania, and then I went off and started a dotcom in the dotcom boom.

"That was a great experience of what it feels like at the other side of the desk," he recalls.

Openreach is wholly owned by UK incumbent BT, but it maintains the same relationship with the retail and enterprise units of BT as it does with other operators in the market. That has sometimes been a difficult balancing act for those at the top of Openreach — if only because BT ownership leaves Openreach vulnerable to claims from BT's rivals that there is preferential treatment: something all at Openreach have continued to deny.

Garner is the first Openreach head not to be hired from BT. Consciously or unconsciously, the group chose someone from outside the company and the industry to run the unit, which is responsible for copper and fibre installations in the vast majority of UK homes and businesses.

Garner took over in February 2014 from Liv Garfield, who had joined BT in 2003 as a sales manager and went on to design BT's fibre-to-the-cabinet broadband strategy. A high flier, Garfield is now CEO of Severn Trent, a water services company that is one of the UK's 100 biggest quoted companies.

Garner, after his brief flirtation with the dotcom boom, became marketing director of The Link, a mobile phone retailer.

He moved to banking, where he was general manager of customer propositions for HSBC. After a decade there he recognised that "all roads lead to Hong Kong" in the bank, "and that wasn't where I wanted to go".

He decided that he "wanted to lead another large-scale people business", so sat down and "made a list of the roles, and BT led the list, and it wasn't alphabetical".

So what were his first impressions? "A hugely impressive organisation that has demonstrated it can manage large-scale complex change. We think of our purpose as building Britain's connected future," says Garner.

Openreach has an awkward relationship with the residential or business users. They're the customers of the telecoms operator — whether it be TalkTalk, Verizon Business, Vodafone, BT or any of the other fixed providers in the highly competitive UK market.

Communications — about contract or installation time — go between the provider and the customer, with Openreach simply acting as the agent carrying out the work. That inevitably can cause some confusion.

It puts Openreach in an "unusual" position, admits Garner. "I don't like the term 'end users'. If there's any confusion, I call them 'end customers', as 'end user' sounds distant. I spoke with the regulator to make sure it was OK. They're customers to me, even if they're not our customers."

Garner has inherited Openreach's policy of installing fibre closer and closer to those customers in order to offer higher and higher speeds to the telecoms operators. The standard model that Openreach uses is fibre to the cabinet, with VDSL from the cabinet into the premises — and that is able to deliver speeds of up to 80 megabits or so in certain circumstances.

The company is looking at ways of driving up speed. Fibre all the way to the users' premises is available in certain areas, though take-up has not been as high as some expected. Now the company is looking at vectoring, a way of increasing VDSL speeds on copper by cancelling out electrical interference.

"Vectoring is close. Vectoring is an enabler," says Garner. How fast? Vectoring and a related copper technology, G.fast, could deliver speeds of a gigabit. Openreach is working with "strategic vendors".

G.fast is likely to be useful over short distances: some say 250 metres, though Openreach offers a more cautious estimate of under 100 metres for a gigabit. "We will see the evolution of G.fast, but you've got to do this in the real world. You've got to industrialise it."

Ultimately, though, there will be limitations to copper. Fibre to the home "is available in limited locations", he says. "It is not a silky smooth, fully optimised solution yet, but it's still early days.

Is there demand for fibre to the home? "It's not where I'm seeing the calls," he smiles. ■

Global Telecoms Business asked a number of leading CTOs of operators about their plans for virtualisation, and the advantages and challenges they see ahead

CTOs ready to try out virtualisation, with customer premises equipment first on list



Ibrahim Gedeon, Telus

Matthew Finnie, Interoute

Enrico Blanco, Telefónica

Luis Jorge Romero, ETSI

The NFV concept is clear. By decoupling network functions from specific hardware, operators can rely on commodity hardware controlled by software to enable the same equipment to perform multiple functions.

That creates an environment in which equipment capacity utilisation can be maximised because capacity simply shifts from one function to another according to demand. It also creates significant efficiencies in reducing the amount of device-specific parts operators must keep in their inventories.

It also streamlines their hardware vendor relationships and potentially allows them to drive better deals because they're buying commodity hardware in bulk to support their services.

Have the operators taken the message on board? Are they moving to implementing virtualisation in their networks?

We decided to put the question to a number of CTOs in the industry. One who is definitely testing NFV is Telefónica's global CTO, Enrique Blanco. Telefónica is planning to try out virtualised customer premises equipment — putting the CPE in the network — in 2015. Blanco is one of the acknowledged promoters of NFV.

Ibrahim Gedeon, CTO of Canadian operator Telus, is more cautious.

From what he knows so far as from his role in an operator, does he believe that virtualisation will offer benefits to service providers and their customers?

"I believe we need to define what we mean by virtualisation," says Gedeon. "In the context of SDN/NFV there are clear end-client advantages, namely scalability and improved reliability and better pay-as-you-grow ability."

In addition Telus believe the overall total cost of ownership should improve, he adds.

Starting from that point, he says, "we believe also the ability to decouple end-client CPE from the equation will enable rapid deployments and upgrades of end-user services."

CPE is where Telefónica will be trying out virtualisation, in its Brazilian market.

"This is the first level of virtualisation that Telefónica will be launching," says Blanco. The idea is to reduce costs by simplifying equipment in customers' premises, "because we can define services in the network, not in the customers' equipment".

That means services will be transportable. If Telefónica provides a particular service in your own home, you will, says Blanco, be able to use it even when visiting friends or family. "You are not dependent on equipment in your home."

Matthew Finnie, CTO of Interoute, gives a brusque answer to the question about whether he believes that virtualisation will offer benefits to service providers and their customers.

"This is sort of an obvious one really," says Finnie. "If an operator cannot see the parallels between network virtualisation and that old shift from SDH to MPLS/IP then they should pack their bags."

The practical benefit, he explains, "is service revenue to asset utilisation".

Virtualisation means that you can "pile more services onto this platform". He notes that 50% of Interoute's revenue on its cloud platform comes from services other than computing and storage — namely unified communications.

"If someone is pondering the case for virtualisation they are probably too late," says Finnie.

Virtualisation is something very new in the industry, that is taking the industry by storm.

The headline gains in operational efficiency that NFV promises only scratch the surface in terms of the potential the technology has to enable operators to introduce new services and generate new revenues from those. Many of these services will be cloud-based and they will also be supported and provided from within operators' own telco cloud environments.

Luis Jorge Romero is the director general of ETSI, the European standards organisation that is at the heart of much of the work towards virtualisation.

"The dominant type of traffic carried by telecoms networks has changed in a short space of time from

simple voice connections to massive amounts of data generated by video streaming services and by connecting the applications running on billions of smart phones,” he says. “This is pushing network operators to drastically rethink their network architectures.”

Are there particular products and services that will benefit from virtualisation? Or will virtualisation offer benefits in other ways?

According to Gedeon, there will be two separate sorts of impacts — one on the end users themselves and one on operators’ infrastructure.

“On the end user aspect virtual CPE — be it enterprise or consumer — is a great service that will offer a more rapid and scalable service,” he says.

It will be “more reliable as the intelligence and data is always safe and stored in the network/cloud”.

This should be “coupled with the scalability aspect”, he adds. Today high-end services require high-end hardware and software. However, virtual CPE ends the need for high-end hardware.

Finnie says that “all products can be virtualised”. The only constraint is how the virtualisation is presented or constructed.

“Also some software vendors resent the lack of control and force licensing to physical hosts — which is not progressive.”

Gedeon adds about operators, or enablers: “Virtualisation in the form of NFV — and SDN as one of its enablers — has basically killed distance and time.”

This means that an operator can have a virtual operator, “or an operator-in-a-box”, that would scale everywhere.

In essence, this would “provide the end clients with an experience similar to what they would get if their services were truly broadband-connected be it by wireless or wireline”.

He cites a potential scenario where an operator can scale down the essential elements of a network — evolved packet core, content delivery network, customer premises equipment and personal video recorder — to offer them in a traditional data centre or exchange/central office.

It means, says Gedeon, “people in rural areas or non-major cities will experience what major urban areas have, among other things”.

This would offer huge benefits to operators, he says. “From a reliability point of view with the operator-in-a-box concept the reliability and service continuity will be unparalleled.”

Blanco makes a similar point. The idea behind virtualisation is that functions in the future will not be tied to specific hardware, he says, but will be provided by capacity in data centres, with the capability defined anywhere “in Brazil, Spain or whatever. You can define specific software and a typical server that is running. You can define these virtual machines in Brazil and use [the service] in Argentina. You are using an analytic approach to define specific software and hardware.”

Romero puts it more technically: “Network virtualisation, network functions virtualisation and software defined networking are complementary concepts that offer new ways to design, deploy and manage telecoms networks and business services.

“Network virtualisation is used to create tunnels or overlays of network infrastructure that separate the

logical topology from the physical topology. Network virtualisation relates to the consolidation of multiple physical networks into one virtual network or indeed the logical segmentation of a single physical network into multiple logical networks, each with defined minimum quality of service levels.”

When will operators start to offer virtualised services? Finnie is characteristically sharp. Interoute has been “for years”, he says. If CTOs of other operators “don’t have it now stop and take up a new career”.

Blanco is planning not only virtual CPE but also virtualised HLR for its mobile networks. The company has a plan to virtualise all its HLRs over the next three years, he says.

“The hardware that we are installing is not proprietary hardware.” It is simply part of the data centre “on rack servers with a communication layer” and Telefónica will be able to host “the HLR capabilities for all of Europe on a single site”.

There will no longer be a need to host separate HLR facilities in each country, says Blanco. “This is efficient because you can host everything at a single point, minimising the capital expenditure.”

At Telus, Gedeon will be offering multi-tiered services with virtualised CPE in 2015, are “on the roadmap for 2015 for both enterprise and consumer services”, he says.

He warns that “there are two challenges that are obvious for us, the first being the issue of privacy as more content and control data is pushed out into the network/cloud, and the other is the paradigm for operations and support”.

But this is “an area that can provide transformational capability for us and our clients”. The alternative: “We can replicate the legacy world and expectations with new technology — which would be a travesty.”

Do CTOs have any doubts about the case for virtualisation as put by vendors and others? If so what are they?

That “really depends on each vendor and where they believe their incumbency lies”, says Gedeon. The initial industry motivation was reduction in total cost of ownership “which is valid”, as well as “incremental technology advancements versus new service enablers and improved reliability”.

But his “gut feel” on this is that “we need a bit more in-depth discussion on this”, he adds.

Finnie retorts: “Vendors are irrelevant here and in truth deeply unhelpful, as they have a view of virtualisation that is simply not a sustainable one for the service provider.”

He explains: “If you are asking your vendor for how to do it and buying it in, you won’t make any money.”

He points to previous experiences with content delivery networks: “Look at how many service providers failed with CDN because they simply bought it in.”

The answer, he says, is that if an operator is not in complete control — which means owning the software — then the business model will shift from being an asset-based model to a pure service play.

That means “you don’t need to own the infrastructure and you’re more like a system integrator”, he adds. “That’s a people scale game and there is a huge amount of over-capacity in the market — so I wouldn’t fancy it myself.” ■

Telefónica sells \$860m stake in China Unicom

Telefónica has sold half of its remaining 5% stake in China Unicom, for about \$860 million, reports Bloomberg.

Spain's largest operator sold 597.8 million China Unicom shares at a 3% discount to the stock's closing in Hong Kong, the Madrid-based operator said in a statement. Bank of America is the sole bookrunner, according to terms of the transaction seen by Bloomberg News.

In the past two years, Telefónica has made acquisitions in countries such as Germany while selling businesses in smaller markets including Ireland and the Czech Republic. The operator, Europe's largest investor in Latin American telecoms, agreed in September



Cesar Alierta: Telefónica committed to strategic reliance with Unicom

to buy Vivendi's Brazilian broadband unit GVT for about \$9 billion.

Shares of China Unicom have fallen 1% this year. Telefónica's venture in China dates back to 2005, when the Spanish company, under chief executive Cesar Alierta, bought 2.99% of China Netcom Group for \$292 million, data compiled by Bloomberg show. The stake was raised to 5% in September that year. Unicom acquired China Netcom Group in 2008 and in 2011, Telefónica increased its stake in China Unicom to almost 10% before selling almost half its holding for about \$1.4 billion in June 2012.

Telefónica has said it remains committed to its strategic alliance with China Unicom.

Tower firm IHS raises \$2.6 billion, Bharti Infratel courts Indian operators, Abertis to dispose of telecoms assets

Nigerian telecoms tower group IHS has raised \$2 billion in equity and \$600 million in debt to finance infrastructure spending and recently agreed acquisitions, reports Reuters

IHS, the largest tower company in Africa, said the equity funding was from new and existing shareholders, but did not provide further details. The loan facility is split into two parts: a seven-year tranche of \$500 million denominated in US dollars and an eight-year tranche of \$100 million in Nigerian naira.

Ecobank, Standard Chartered, Standard Bank, Investec and the World Bank's International Finance Corporation (IFC) participated in the loan, IHS chief executive Issam Darwish told Reuters.

"This is the largest equity raising by a private entity for the past seven to eight years in Africa — you've had mining, banks and now telecom infrastructure as a standalone sector is commanding this much interest from the international markets," said Darwish. "This sends the right signal, it's saying the international investor community believes

in Africa and they're putting a substantial amount of money behind that."

In September, South Africa's MTN agreed to sell 9,151 mobile towers in Nigeria to a new joint venture with IHS in a deal MTN said would cut its costs and boost its call and data capacity in Africa's most populous country.

That was MTN's fifth tie-up with IHS following deals in Ivory Coast, Cameroon, Rwanda and Zambia.

IHS in August agreed to buy and lease back 2,136 towers from Etisalat Nigeria, a unit of Abu Dhabi's Etisalat.

Tower company Bharti Infratel has approached Vodafone and Idea Cellular to buy their mobile towers in seven out of 22 telecoms circles in the country, reports India Today.

"I have made it very clear to Vodafone and Idea Cellular that we are interested in buying their towers in seven circles where Bharti Infratel is [the] sole operator and Indus doesn't operate," Bharti Infratel executive chairman Akhil Gupta said.

Infratel has over 36,381 standalone mobile towers spread

across 18 states under 11 telecoms circles.

The company also has a 42% stake in Indus Towers — a joint venture between Bharti Infratel, Vodafone and Aditya Birla Telecom.

The states where Bharti Infratel has no overlapping business with Indus include, Jammu and Kashmir, Himachal Pradesh, Madhya Pradesh, Chattisgarh, Bihar, Jharkhand, Odisha, Assam and North Eastern states. These states jointly come under seven telecom circles.

"We are waiting for them to come back. If, at all, they are ready we will be certainly pursuing the matter," Gupta added.

Spanish toll roads operator Abertis plans to spin off and list its telecoms business and increase returns to shareholders, reports Reuters.

Abertis declined to say what percentage of the telecoms business, which comprises radio, TV and telephone towers, would be listed, but the group's chief executive expects the exercise to maximise the unit's valuation.

Analysts have estimated its value at about € billion (\$3.8 billion).

Iliad pulls out of T-Mobile US offer but DT chief says operator can remain independent

Iliad has scrapped its offer to buy a majority stake in T-Mobile, joining Sprint and AT&T in failing to secure a takeover of the smallest of the four major US mobile operators, reports Bloomberg. Board members of Deutsche Telekom, which owns two-thirds of T-Mobile US, have been split over whether to sell its only growing asset.

T-Mobile US chief executive John Legere said he was “sick and tired” of deal speculation. He also said there are a number of ways for the operator to be a growing, profitable company without being acquired.

“The company is doing extremely well so I can do whatever ... I want,” Legere said, when asked about his relationship with Deutsche Telekom.

Legere has numbers to back him up. T-Mobile added 2.68 million monthly subscribers in the first half of the year, making it the fastest-growing mobile operator in the US. Legere has forecast that T-Mobile will surpass Sprint in total subscribers by the end of this year.

Anne Marshall, a spokeswoman for T-Mobile, declined to comment yesterday after Iliad dropped its bid for 67% of T-Mobile that valued the stock at \$36 a share including cost savings. Iliad said that Deutsche Telekom had spurned the

improved offer. Andreas Fuchs, a spokesman for Bonn-based Deutsche Telekom, declined to comment immediately.

Although Deutsche Telekom’s chances of exiting the US have diminished after the operator rejected an \$18 billion improved bid by France’s Iliad and Sprint withdrew from takeover talks in August, the operator has said it is confident of its US unit’s prospects, reports Bloomberg.

“We are looking into the options, but nevertheless we have an independent, self-funding future for our activities in the US,” Timotheus Hoettges said. “It is a great business, it is a great perspective, we could have a lot of potential to realize in the future.”

T-Mobile is likely to require billions of dollars of investments in network quality and customer acquisition in the coming years. Still, selling T-Mobile would eliminate a third of Deutsche Telekom’s revenue and cut off its only growing unit.

A combination of smaller players would be better-equipped to compete with US market leaders Verizon Communications and AT&T than they are as separate challengers, Hoettges added.

“These two companies are generating more than 100% of the total cash flow of the industry,” Hoettges said. “It is much better if there would be



Timotheus Hoettges: It's a great business with a lot of potential to realize

a combination or consolidation of smaller players to attack the bigger players in a more efficient way.”

Verizon has reported its net cash from operating activities reached \$23.2 billion in the first nine months. The largest US wireless operator missed profit estimates as more new subscribers took advantage of discounts on devices.

While Dish may make a move for T-Mobile, Deutsche Telekom’s planning has shifted to how it can keep the unit’s growth momentum going and how it can secure sufficient wireless spectrum in auctions scheduled through the middle of next year, a person familiar with the matter said this month.

Viettel to invest \$1bn in new Tanzania 3G network

Viettel plans to invest \$1bn in a new third-generation mobile phone network in Tanzania, the office of the east African country’s president has said, reports Reuters.

The mobile market in east Africa’s second-largest economy has grown rapidly over the past decade, driven by demand for 3G mobile services. There are about 29 million mobile subscribers, representing market penetration of 64%, according to the country’s telecoms regulator.

“Viettel will invest \$1 billion in telecoms and other services in Tanzania, hence making Tanzania the second country after Peru to receive its telecoms technology,” said the Tanzanian president’s office in a statement.

State-owned Viettel, which is run by Vietnam’s Ministry of Defence, won its Peruvian mobile licence in 2012.

Viettel chairman Manh Nguyen Hung made the investment pledge when Tanzanian President Jakaya Kikwete visited the company’s headquarters in

Vietnam. The company will offer low-cost smartphones and provide free internet services to schools, hospitals and offices.

Tanzania announced this month that it had granted a mobile phone licence to Viettel, which is expected to launch its mobile services next July.

Viettel will compete with the country’s four other operators: Bharti Airtel, Etisalat-owned Zantel, Vodacom Tanzania, owned by South Africa’s Vodacom, and Tigo Tanzania, which is part of Sweden’s Millicom.

Fixed-line broadband is growing rapidly, driven by demand for data, video and mobile traffic. Peng Qiang offers an approach based on ultrafast pipeline, simplified and intelligent network, and on-demand deployment

Big Broadband is the future infrastructure enabler for a fixed-line broadband future



Peng Qiang: The ZTE Big Broadband concept is the future infrastructure enabler that will create more growth points for operators

The development of global fixed-line broadband seems to have reached its plateau of productivity.

With hot emerging internet technologies such big data and over-the-top services, and the entire industry turning to focus on 4G network build-outs, what is the future of the fixed-line broadband? The US operator Verizon, after analysing broadband development since 1987, concluded that global broadband is growing tenfold about every six years.

It is generally accepted in the industry that fixed-line broadband will continue to grow fast.

Fixed-line broadband development is driven by the following three factors:

■ **Data transfer:** In the world where digitalisation is ubiquitous, the value of a network lies in effective transfer of mass data. Highly-efficient and intelligent broadband infrastructure not only meets current service demands but also stimulates consumption and industry development, from which operators can benefit. By supporting the forwarding and transfer of information and cash flow data, operators can create more value from information collection, distribution, processing, storage, transmission and consumption.

■ **Mobile broadband:** The exponential growth of mobile devices and traffic is the new driving force for fixed-line broadband development. It is estimated that 80% of mobile device traffic will be carried by wifi by 2016. Even before then, the mass deployment of 4G small cells will bring new opportunities for fixed-line broadband development.

■ **Video connections:** Video connections have always been the primary driving force for the fixed-line broadband development. It can be predicted that the number of video connections will escalate in the near future, as will internet-connected terminals — especially mobile terminals and sensor terminals.

At the same time, user expectations will accelerate. Broadband networks need to meet the following two requirements when demands for mobile devices, traffic and home video service increase rapidly:

■ **High bandwidth:** The bandwidth capability of broadband networks should be enhanced to guarantee data operation and to meet insatiable demands for video services.

■ **Intelligence:** Broadband infrastructure intelligence must be implemented to help customers exploit more value from information collection, distribution, processing, storage, transmission and consumption, and incubate more business models.

With this industrial background, ZTE puts forward

its Big Broadband concept. We in ZTE think that fixed-line broadband networks conforming to the big broadband concept will be able to support broadband operation in the big data era.

Big Broadband

The ZTE Big Broadband concept has three features: ultrafast pipeline, simplified and intelligent network, and on-demand deployment.

■ **Ultrafast pipeline** enables continuous technology evolution and broadband upgrade, integrates copper and fibre resources as well as wireline and wireless, provides enriched and highly-adaptive central-office end and terminal interfaces, implements elastic access according to users' bandwidth, and builds competitive networks.

■ **Simplified and intelligent network** makes network architecture and service provisioning easier, implements integrated access, unified management, zero touch maintenance and plug-and-play to facilitate network monitoring, detection and proactive maintenance, and provides southbound, northbound and application programming interfaces.

■ **On-demand deployment** provides different access according to end users' requirements for services, bandwidth and charges, and uses suitable equipment to meet deployment requirements under different application scenarios, thus keeping the balance between construction cost and network competitiveness.

Ultrafast pipeline

Today ultrafast pipelines for broadband services are the operators' core businesses, and consequently the cornerstone and source of operators' values. Firstly, ultrafast pipelines are the basis for information transfer, and the operators should guarantee that their ultrafast pipelines maintain a leading position and have competitive advantages, thus obtaining stable and long-term profits.

Secondly, operators need to consider how to expedite information transfer using their these ultrafast pipelines. On the one hand, the operators can meet user requirements and drive up revenues by upgrading and continuously evolving their ultrafast pipelines; on the other hand, the operators can exploit and create new values from ultrafast pipeline innovation.

The 10G-PON technology is at the transition point of broadband development, and is most suitable for the current stage of broadband development. It has clear advantages such as high bandwidth and full-

scenario coverage, and can be migrated to NG-PON including NG-PON2 defined by ITU and NG-EPON defined by IEEE.

NG-PON technology is not just an upgrade of bandwidth from 10G to 40G or higher: it migrates from TDM to hybrid WDM+TDM, and to a simplified and intelligent network architecture capable of full-service and full-scenario access.

The NG-PON technology integrates xPON, 10G-PON and NG-PON, meets access requirements for mobile and virtual service scenarios for home, government and enterprise, and provides a converged wireline and wireless and copper and fibre network architecture.

Simplified and intelligent network

A simplified and intelligent network consists of two dimensions. The first is simplification — to simplify user access and ensure users to obtain services in a convenient way, thus supporting effective data exchange and communication. One pipeline carries all services and meets service requirements for all scenarios.

The other dimension is intelligence – to allow user access and ensure user quality of experience to speed up data transfer and to expand network values. Network intelligence exploits user QoE values on the user side, upgrades network operation efficiency on the network side, and expands services on the service side to achieve mutual benefits for operators and vendors.

On-demand deployment

In the digital era, operators undergoing transition and pressured by insufficient funds must adopt flexible on-demand deployment strategies to shorten service delivery time.

■ **On-demand service strategy** uses a pyramid model to classify users into different groups according to their value, and chooses different service strategy for different groups to maximise investments.

■ **On-demand networking mode** employs integrated fibre optic and copper strategies including fibre to the cabinet, building, distribution point (FTTdp) and home to provide services in an efficient and budget-friendly way.

■ **On-demand technology choice** uses different fibre optic and copper access technologies including GPON, XG-PON, NG-PON2, GE/10GE, VDSL2 and G.fast according to legacy pipeline resources to maximise resource values.

With flexible FTTx deployment strategies, the operator's priority is to deploy fibre to the home in areas where conditions permit in a single step.

If conditions are difficult for fibre to the home, other solutions for low-cost broadband solutions are needed, continuing with copper as part of fibre to the cabinet, building or distribution point.

All operators should make full use of fixed-mobile integration to offload traffic, while using the advantages of fixed-line resources and bandwidth to access small cells.

The ZTE Big Broadband concept comprises three features — including ultrafast pipeline, a simplified and intelligent network, and on-demand deployment.

The ultrafast pipeline is the cornerstone of the ZTE Big Broadband concept. Network architecture simplification and operating efficiency enhancement are permanent themes for operators to develop their networks and control total cost of ownership.

Network efficiency can be upgraded dramatically if operators build intelligent networks. Legacy resources and new resources need to be considered in network deployment to effectively reduce capital expenditure under the premise that customer requirements are met.

On-demand network deployment reinforces customer stickiness, implements positive operation, increases profits, and helps operators grow.

Business models

The ZTE Big Broadband concept is the basis for fixed-line broadband operation, and operators are paying more attention to selection of a viable business model.

ZTE classifies operators' business models into the following three types according to their features:

■ **New-entrant operators** can solve the problem of lack of funds by outsourcing construction, operation and maintenance to solve the problem of insufficient operating experience. This model allows construction and operating expenditures to be controlled, ensuring profits, and increasing revenues through effective broadband network deployment and bundled service packages offered at an affordable price. Examples of users of this model include Spain's Jazztel, Thailand's True, Romania's RDS and Lithuania's TEO.

■ **Traditional operators**, with many customers and large-scale networks, can make full use of legacy network resources to gradually accelerate broadband speed and construct a broadband ecosystem by integrating resources and collaborating across boundaries. Indonesia's PT Telkom, China Telecom, Russia's MGTS and Uruguay's Antel benefit from this kind of business model.

■ **Mobile operators** have a cross-boundary business model. They can exploit customer resources to develop high-end and commercial customers selectively, and to cultivate fixed broadband subscribers. They can use existing network resources and deploy fibre to the mast and fibre to the WLAN to enable coordinated development of mobile and fixed networks. They can provide bundled service packages to develop customers efficiently. China Mobile is a typical example.

The main driving forces of broadband development include an increasing use of video and other services, as well as competition and national broadband strategies.

The development of fixed-line broadband is sustainable and is the cornerstone for operators' networks in the big data era.

Intelligent networks capable of providing higher bandwidth are needed to guarantee traffic operation and to help operators revitalise.

The ZTE Big Broadband concept, based on ultrafast pipeline, simplified and intelligent network, and on-demand deployment, is the future infrastructure enabler that will create more growth points for operators and help them develop in leaps and bounds. ■

AT&T and Verizon will allow cross-network VoLTE calls in the US in 2015, as other operators around the world plan how to promote the benefits of VoLTE

Operators set for advantages of voice over LTE



Alex Arena of HKT: VoLTE is game-changing. Callers will be able to switch instantly from voice to video

The last few months of 2014 have seen a surge of interest in voice over LTE, with trials and real-life implementations from the US to China.

Without VoLTE — which is normally pronounced “volt-ee” — LTE phones have to resort to 3G technology when the owner makes or receives a call. Basic LTE is not compatible with voice calls. But VoLTE will allow operators to offer enhanced voice services.

In early November 2014, the two largest US operators, AT&T and Verizon, said they would introduce

interoperability for VoLTE customers during 2015 — the first step to moving all mobile voice calls to IP.

That will allow other benefits to be offered, including high-quality voice, integration with video calls, rich messaging and other services.

Tony Melone, chief technology officer at Verizon, commented: “Interoperability among all VoLTE providers takes connectivity to the next level with HD quality voice and additional features that customers want.”

Krish Prabhu, president of AT&T Labs — and AT&T’s CTO — confirmed the companies are working together: “We are pleased to work with Verizon on this initiative,” he said.

“Interoperability of VoLTE between wireless carriers is crucial to a positive customer experience. Customers expect to be able to connect anywhere, anytime — and, as LTE technology continues to evolve, it’s imperative that we provide a seamless experience between carriers.”

The talks are not confined to AT&T and Verizon: “We continue to work with others in the industry on similar collaborative arrangements and hope to see similar collaboration across the industry in the near future,” said Prabhu.

Melone added: “We look forward to working with other operators as VoLTE continues to grow.”

And growing is what VoLTE is doing. Hong Kong is one of the world’s leading markets. In October 2014 mobile operator CSL, which uses ZTE infrastructure, said that nearly 100,000 customers were using VoLTE.

Several months before, HKT — which has bought CSL and is expected to be merging the brands — said it was the first operator in Hong Kong to offer commercial VoLTE, using equipment from Huawei.

Alex Arena, HKT’s CEO, said: “We are committed to providing the most advanced and compelling services to customers. Our game-changing VoLTE service will be offered to new and existing mobile customers.”

Among the advantages: it takes under a second to set up a VoLTE-to-VoLTE call, and callers will be able to switch instantly from voice to video, with pictures of at least 640 by 480 pixels.

It’s been a complex technology to develop and standardise. One of the trickiest problems has been to ensure that calls that start in VoLTE are not dropped if one of the callers moves out of 4G coverage. Release 10 from the industry’s standards body, 3GPP, set the rules for enabling seamless handover from 4G to 3G.

It’s the continued coexistence of 3G that has been one of the challenges: it is not an IP technology, and if there is no VoLTE all voice calls from LTE phones resort to 3G, which means all data goes back to 3G for the duration of the call.

Alex Sinclair, the GSM Association’s CTO, commented: “Embracing an all-IP future is vital for operators worldwide.”

Meanwhile European operators have been slow to adopt, or even try out, VoLTE. Vodafone waited until August before made its first VoLTE call — and that was in its UK lab in Newbury.

Fergal Kelly, CTO at Vodafone UK, said: “We’ve been continually developing and investing heavily in our UK network since it launched nearly 30 years ago. Our trial of VoLTE, less than a year after the launch of our 4G network, is the next major innovation.”

Telefónica said in October that it was working with Ericsson to develop VoLTE for its O2 network in Germany.

Telefónica was cautious about setting a date for a launch, noting that “the commercial launch will take place once Telefónica has secured the full VoLTE device eco-system for mass-market launch.”

Karsten Schröder, the company’s head of converged solutions, said: “VoLTE is not just a standard, but can be used in a real-life multi-vendor environment. As a result, the convergent architecture allows us today to deliver seamless services agnostic to the physical access by which the customer is connected to our network.”

The Middle East is a touch faster than Europe, with the first commercial services — on Dubai’s du — launched in October, using Nokia infrastructure.

Saleem Al Balooshi, the operator’s executive vice president for network development and operations, said: “We will be able to use the full potential of LTE mobile broadband technology by ensuring seamless HD voice calls and video over our LTE network.”

The company plans to follow with “HD multimedia services including browser-based apps for video conferencing, chat, file sharing and other services for our customers”, added Balooshi. ■

Big data promises much but operators need to ensure they can extract valuable intelligence from the huge volume of data to make their big data investments sustainable and scalable as data volumes increase

Operators must evolve their data collection strategies to ensure their big data initiatives remain viable

Edoardo Rizzi: If you don't do a good job of extracting and enriching the data you produce you just propagate complexity further downstream and make big data solutions and projects non viable or non sustainable



Big data is only going to get bigger for operators as the number of smartphones and other machine-to-machine devices continue to grow exponentially and their interactions with the network continue to increase in frequency and volume. That presents a CPU and storage challenge for operators which will only continue to grow significantly and linearly with the amount of traffic. In fact, it will increase as data volumes increase, unless operators take different approaches in terms of data collection that enable them to extract data that has value or potential value and discard the rest.

Not only could the costs of big data rapidly become unsustainable, but those who are looking for valuable insights to act upon will be swamped by a deluge of unanalysed data that offers little value or upside.

“Big data analytics to me means being able to extract valuable intelligence from a huge amount of data,” explains Edoardo Rizzi, the vice president and general manager of JDSU. “Big data has only been a big pain for operators until now and there are two key challenges with traditional approaches.”

“Big data analytics has to work today but it also has to have the capability to scale up as the volume of data increases,” he says. “If it can't do that, the system will not be viable next year because the costs of collecting and analysing the data will rise unsustainably.”

Rizzi points out that at one mobile operator JDSU has worked with, a CEM system was collecting 17 terabytes of data per day to support a network of three million subscribers. That helps to provide an understanding of the volumes involved and the potential for wasted effort.

Added to that, inefficient initial processing will result in huge volumes of raw data moving through the business which will then have to be analysed by individual business functions to get the insights they require, resulting in more cost for storage and processing and less agility.

What's needed is a new approach to big data that cost-efficiently and quickly identifies useful or valuable insights and makes them available in real time to the big data analytics applications. Operators' networks generate huge amounts of data, much of which is not of value so it makes sense that minimal big data resources are expended on this largely-irrelevant data.

“From an operator's perspective not all traffic is equal,” confirms Rizzi. “They want to focus on what has real value and make sure the extraction of intelligence is proportionate to the value it can create.”

Operators need to be able to prioritise the services that they can generate value from big data with and treat less valuable services in a more commoditised manner. To help them achieve this, JDSU has developed its SMARTanalytics proposition as part of its Analytics Enablement offering — the SMART stands for Synchronised, Meaningful, Adaptive and Real-Time.

“SMARTanalytics is quite simple. It is built on the premise that you can't really extract value from big data in an efficient, effective and sustainable way unless you figure out a way to first codify in real-time the data itself and the value in it right at the collection source,” says Rizzi. “Once you address the volume challenge at that level, then the rest of the value chain will function in a sustainable and efficient way.”

- **Synchronised** refers to the correlations across data points that are established.
- **Meaningful** describes the resulting analytics, which must be immediately relevant and actionable to the application that uses them.
- **Adaptive** means the analytics must be able to change to dynamically account for new data as well as for new needs by the downstream applications.
- **Real-time** requires the analytics to be available within seconds or less.

“Many analytics applications are built on top of raw data instead of on top of a common layer of processed intelligence,” says Rizzi. “We have to establish very meaningful correlations at the layer where we collect the information.”

For Rizzi, that's the key. “The value lies in the relevant correlations,” he concludes. “One piece of data in itself is never extremely valuable. The value comes in applying the intelligence to create the correlations that can be acted on to produce real value and make a sustainable business case for big data.” ■

Airtel, Etisalat and MTN are all companies that have outsourced their African towers to specialist operators

Tower deals means operators boost efficiency



Omobola Johnson: Not enough telecoms infrastructure in Nigeria

Operators in Africa, India and south-east Asia are raising revenue by selling their tower infrastructure to specialist companies.

In the past few months deals have been done by service providers which once regarded their tower infrastructure as something special to them. Now they are recognising that they lose little by selling towers. And at the same time they raise money and offload the headache of operating and maintaining passive infrastructure to specialists.

Africa's MTN group reached a deal in September to transfer 9,151 towers in Nigeria to specialist company IHS.

This was the ninth tower transaction for IHS and its fifth with MTN — following earlier deals with the South Africa-based company in Cote d'Ivoire, Cameroon, Rwanda and Zambia that took place in 2012 and 2013.

"We are delighted to have entered into a further transfer transaction with IHS, in our largest African market," said Sifiso Dabengwa, group president and CEO of MTN.

On completion of this Nigerian transaction, IHS will manage over 20,000 towers in Africa.

Dabengwa paid tribute to IHS's "deep knowledge and considerable experience in the sector" that "will help drive efficiencies and enhance our network uptime, allowing us to concentrate on further raising our own service levels, improving the customer experience and ensuring we remain the number one operator in Nigeria."

As Alan Harper, CEO of rival infrastructure provider Eaton Towers, says in the interview on pages 40-41, among the headaches operators avoid by outsourcing towers are security, maintenance and refuelling. In regions where there is unreliable mains power, towers need battery back-up and diesel generators — both items that need heavy security.

In Nigeria, MTN's towers will be transferred to a new company which will be owned jointly by MTN and HIS, with IHS having full operational control of the underlying business.

Michael Ikpoki, the CEO of MTN Nigeria, said that the separation of MTN Nigeria's mobile network towers and operation of the underlying towers business by IHS "reflects a major part of our strategy to optimise network quality and technological assets towards creating value and driving innovation to meet our customers' needs now and in the long term."

He said that cost efficiency and optimisation of assets played an increased role in the industry as operators tried to be competitive. "We will continue to embrace strategies that enhance our services to our customers while ensuring our long-term business continuity, without compromising best practice," said Ikpoki.

The new IHS-MTN towers company will market independent infrastructure-sharing services to other mobile operators and internet service providers in Nigeria.

That should allow MTN's rivals to expand their coverage, something that will go down well with Nigeria's communications technology minister, Omobola Johnson. In October she complained about poor coverage and service quality, adding that between them the operators have 25,000 base stations, to serve over 130 million subscribers. "We do not have enough telecoms infrastructure in the country," she said to a Nigerian newspaper.

"Since the infrastructure is not enough, we therefore need more of it and operators should not be discouraged from building additional infrastructure," she added.

Johnson, an electronics engineer who ran Accenture's Nigerian operation until she became minister, welcomed the move towards outsourcing of towers, though her remarks are likely to mean IHS and its rivals are pressured to build more.

Etisalat is another operator that has outsourced 2,136 of its Nigerian towers to IHS.

Meanwhile in Thailand some of the potential benefits of outsourcing were demonstrated in October when the country's third biggest operator, True, said it would lease space on its towers to rival company TAC, the third biggest operator, which is owned by Telenor.

The deal will start modestly, with only 115 towers involved, to allow TAC to expand its 3G coverage. But TAC's CTO, Khalid Shehzad, said the company wanted to take more capacity: a survey showed 500 towers in areas it needed to serve.

True said it was happy to lease capacity to other operators, including AIS, which is the biggest in the Thailand market. True said it plans to lease capacity on 3,000 towers within months and 6,000 by the end of 2015, according to reports.

But selling off tower assets — as MTN and Etisalat have done in Nigeria — rather than sharing is the more common approach. In 2014 Helios Towers Africa announced that it was taking 3,100 towers in four countries from Bharti Airtel. That move gives HTA a total of 7,800 towers across Africa.

Bharti chairman Manoj Kohli said the deal was "another milestone in Airtel's growth journey in Africa".

He noted that "Airtel pioneered the concept of a separate tower entity to promote infrastructure sharing in India and this agreement is a continuation of that philosophy".

The move will encourage "the consolidation of tower assets across Africa that will drive industry-wide cost efficiencies through infrastructure sharing", he added. "The agreement will further help in accelerating the growth of telecom services in the continent and at the same time benefit the environment by avoiding duplication of infrastructure."

HTA's CFO, Andres de Orleans-Borbon, will be speaking about tower sharing at the Global Telecoms Business CFO summit in London on 24-25 March 2015. ■



Sifiso Dabengwa of MTN: Deal will drive efficiencies and enhance network

CEO and CFO Guide to SDN — introduction



Photo: © Jérôme Galland, Getty Images for Orange

Software defined networking (SDN) along with separate but closely aligned technology network functions virtualisation (NFV) is transforming operators' traditional reliance on specific items of network equipment to perform specific functions. The separation of hardware from the function it performs promises greater flexibility, maximised network utilisation and reduced cost of ownership for operators.

That message appears to have got through and the concepts of SDN and NFV are widely understood, if not always in their more intricate

detail. We're now seeing the conversations turn from what is SDN to how can we deploy it.

A large amount of work is being done with most operators trialling or piloting at least some form of NFV. SDN will come later but will be potentially easier to deploy because it is well understood in the data centre already. However, pilots and trials don't make a market reality and that is something that is still at least a year away.

That will come as a relief to many because operators are not sufficiently prepared

to run virtualised networks. Their staff are highly skilled traditional networking experts that don't have the IT skills SDN requires. However, with roll-out timescales being measured in years and the expected continuation of traditional technologies for more than a decade a staged process of retraining can be put in place.

Perhaps of more urgency is the OSS which will need to become far more powerful and flexible to take account of the complex service chains that will exist across virtualised estates. Systems will need to

address the dynamic nature of virtualised environments and there is the real danger that current systems could become a bottleneck.

A final observation is the amount of control needed will be significantly increased as operators work to orchestrate the network to carry the traffic according to the quality needed. That will involve a hybrid environment of new and traditional equipment so the short-term picture will be more disruptive and complex than the idealised final state of pure NFV supported by SDN.

Service providers are looking for the advantages they will gain from software-defined networking. Dan Pitt introduces our CEO and CFO Guide to SDN by itemising five clear benefits

Lower costs, faster deployment and better video among ways operators will benefit from SDN



Dan Pitt: It may be possible to deploy NFV without SDN, but not having SDN puts a restriction on how far changing the network can go

Software-defined networking is making its presence known within the industry, and has struck a chord with operators. While it may seem as though network functions virtualisation is top-of-mind for operators, SDN is acknowledged to be an essential foundation of NFV.

Although it may be possible to deploy NFV without SDN, not having SDN puts a restriction on how far changing the network can go.

SDN is being recognised for providing scalability, which is important and valuable for operators for continued network performance improvement, enhancement and capacity expansion, and for its essential benefit of enabling network programmability. Indeed, NFV over a rigid network can be an exercise in frustration.

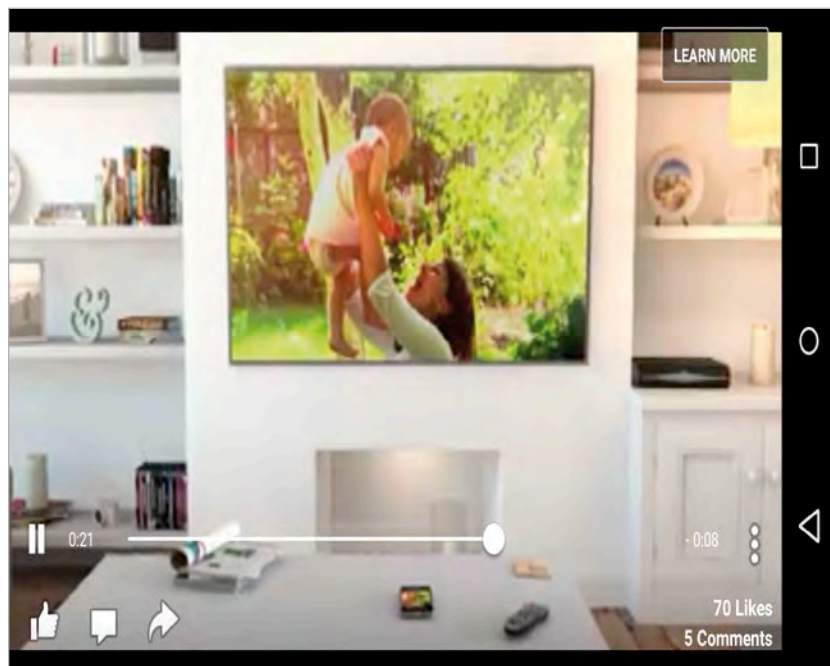
With SDN implementation, telecoms companies have the ability to address many of the pain points currently plaguing their networks, and provide both their own internal operators and their enterprise customers with numerous benefits.

Benefits that SDN can provide include lowered costs, more rapid deployment of new services, better video optimisation, and the ability to better serve customers at a higher and more rapid level.

The top five benefits for service providers that adopt SDN are:

- video optimisation;
- cost reduction;
- rapid deployment of new service;
- moving away from proprietary hardware; and
- better visualisation of the network.

On an average day 52% of mobile data traffic is video, says Citrix — including this promotion for Sky distributed in the UK via Facebook



Video optimisation

According to the latest Citrix mobile analytics report, on an average day 52% of mobile data traffic is video. The same report released in the second quarter of 2013 showed mobile network traffic associated with video then represented 45% of mobile data traffic. That's an increase of seven percentage points in a little under a year.

Video-based services in particular account for a large portion of the traffic, imposing significant demands for network functions such as media transcoding and content caching.

With mobile video streaming being at an all-time high and expected to grow more, the application of SDN and NFV to the network is the best route for operators to efficiently impact their business and improve quality of experience. In particular, they can schedule or reserve capacity according to their business priorities, such as for revenue optimisation, quality of experience per-customer and user-platform customisation.

By focusing on the network services chain, service providers of all sizes can deploy optimised network service chains, including video and web optimisation. With SDN, operators are able to more efficiently meet the mobile video demands of their consumers.

Cost reduction

With SDN, operators can lower both capital and operational expenditure, reducing overall expenses significantly.

A Strategy Analytics report found that for telecoms providers, the biggest cost savings — of over \$1.1 billion — would come from the ability to create a single virtual network out of all the various network types within a metro area.

Consolidating the traffic of wired, mobile, enterprise, and residential connections into a single virtual network would lower operation costs by allowing networks to be managed from a single console.

A follow-up report from Strategy Analytics also found that SDN has the potential to increase efficiency of networks enough to save operators more than \$4 billion in capex by 2017. On the other hand, opex will be saved in key network applications including wifi offloading and cloud-based radio access networks, and in combining SDN with NFV, reducing or eliminating the heavy cost of separate administration teams for each family of appliances.

Rapid deployment of new services

More than any other reason, dramatically increasing service and revenue velocity is the number one reason operators embrace SDN.



Standards such as OpenFlow allow for an open, robust SDN architecture that enable multi-vendor interoperability.

Most importantly, the separation of forwarding — hardware — from control — remote software — fosters the acceleration of high-performance packet processing in the forwarding plane at diminishing cost, along with the far-greater flexibility in the control and management planes, to meet the individual needs of different operators and applications.

OpenFlow-based SDN has its own benefits for mobile networks as well. SDN control software can control any OpenFlow-enabled mobile network component from any vendor. Rather than having to separately manage groups of devices from individual vendors, operators can use SDN-based orchestration and management tools to quickly deploy, configure, and manage multi-vendor networks.

Operators can use SDN to create a single virtual network out of all network types within a metro area, saving \$1.1 billion, says Strategy Analytics

Small and large enterprises alike have been drawn to the cloud services of the over-the-top providers, and the operators have the infrastructure to compete on a global scale if they embody SDN in their internal clouds and their external cloud and WAN services.

Mobile has always been changing continually — and fast. With that comes a requirement for fast rollout of new mobile services and rapid adoption of new technologies. The market for mobile services has traditionally been highly competitive, but service providers now have to retain relevance in the market and compete with internet giants that now offer traditional mobile services.

The benefit of SDN is that services can be tried in realistic scenarios before being put into production — often instantly. And they can be offered inexpensively and experimentally to small user populations to see what succeeds in the market.

Deploying new services in large-scale networks can be a long and tedious process that requires extensive rounds of testing and validation to work out all the kinks. With SDN, service providers can deploy new services more rapidly and efficiently.

Operators and enterprises seek to deploy new capabilities and services in rapid response to changing business needs, user demands, or sudden opportunities. At its full potential, SDN can enable operators to shift network resources to meet demand and keep customers satisfied by automating the management and orchestration, thereby reducing the time to market for new services.

Moving away from proprietary hardware

Current hardware is expensive to buy, manage and support when an operator is locked into a single vendor. A key factor is the bundling of the control software — which has been proprietary — with the hardware.

With SDN, operators can move away from these proprietary hardware and software expenses. SDN accelerates innovation by breaking the bond between proprietary hardware and control and application software.

Better visualisation of the network

Being able to visualise the network is crucial for operators. With SDN, service providers can gain insight into a network's overall functioning, and be able to understand conditions and issues in the network.

The ability to track network conditions will help pinpoint and remedy problems or insert services to available capacity.

With better network visualisation, operators are able to get down to the individual application flows, and accelerate the speed of troubleshooting.

The SDN model allows operators to tweak the network on a granular level, such as policy control. Policies including session, user, device and application levels can be applied in an automated manner.

This control enables service providers to support multi-tenancy while maintaining traffic isolation, security and elastic resource management when customers share the same infrastructure, and maximise revenue while doing so.

SDN has numerous benefits for any network, and operators have begun to take an interest in accelerating its implementation. By addressing a network's pain points — that include scalability, manageability, flexibility and cost — SDN could be the solution that operators have been looking for.

The most important part of any business is satisfying existing customers and attracting new ones. SDN provides operators with a unique opportunity to do this while minimising operational costs and developing competitive advantages.

The keys are moving from proprietary — and costly — hardware to a software, IT-based business structure, optimising services — including video — for customers, and being able to innovate more and deploy new services as fast as they want.

SDN has the potential to redefine the telecoms industry for agility and revenue growth, and ultimately improve the end user's overall experience. What operator wouldn't want that? ■

Dan Pitt is executive director of the Open Networking Foundation
www.opennetworking.org

The debate has moved on from what NFV and SDN are, write Glen Ragoonanan and Dana Cooperson, to the implementation of the technology. They report from this year's SDN & OpenFlow World Congress

The 'how to do it' debate takes over from the 'what is it' NFV/SDN discussions



Deutsche Telekom data centre: the company believes that service providers need reliability at the service level, not the box or functional level, if they want to harness the strengths of IT and telecoms and change the balance of power with OTT providers

The communications industry is beginning to talk about how to implement network functions virtualisation (NFV) and software-defined networking (SDN).

This year's SDN & OpenFlow World Congress marked a shift from previous events where the focus was on discussing the nature of the technology. Vendors at the 2014 event, which took place in Düsseldorf in October, were demonstrating proof of concept trials and operators were showcasing implementations in their networks.

However, it will take years to justify the business case, implement roadmaps, define standards and overcome the operational and organisational challenges involved in deploying these technologies. Simple orchestration, control and management architecture will help operators and vendors to prepare for the digital economy.

The industry needs new thinking to realise the benefits of NFV and SDN. At the third annual SDN & OpenFlow World Congress, NFV was in the spotlight, thanks to: the release of the third white paper on NFV by ETSI, as well as the formation of an open source collaboration initiative, the Open Platform for NFV Project or OPNFV; and the inauguration of the ETSI Mobile-Edge Computing initiative and technical white paper release.

Cloud computing

SDN's progress at the transport and switching layers — layers one to three — is clearly advancing thanks to the take-up of cloud computing in the business market.

The move to virtualised next-generation networks (vNGNs) will be as monumental as the shift

from analogue to digital. However, three important areas will require significant work during the next two to three years:

- establishing sound business cases for NFV and SDN;
- planning business and network evolution priorities with revolutionary technology;
- managing organisational and process changes.

At the world congress, in an Analysys Mason-led panel discussion on managing next-generation networks, executives from Colt, Deutsche Telekom and Telefónica called for new thinking to ensure that we overcome existing, past and even future challenges.

The following is a summary of the guidance that service providers would like to pass on to their vendors:

- **Stop thinking, and developing solutions, in silos:** operators expect vendors to develop solutions in the context of the end-to-end bigger challenges and opportunities, and not confine them to the vendors' own range of technology solutions and areas of strength.
- **Change operations:** operators and vendors need to begin to develop flat development and operations organisations, where the design, development and operations team are equally responsible for the problems and success of operations and delivery — time to market. Organisations will be required to change their structure, corporate culture, staff mindsets and skills, and tools/systems.
- **Increase process automation:** ETSI's industry specification group for NFV included operations and OSS in its third white paper, further highlighting the emphasis that the industry is placing on NFV implementation and operations. Service providers on the roundtable panel noted that the cost of running a poor and/or complex implementation for at least 10 years may have been a feature of the past, but will be unacceptable in the future. Some operators were comfortable with a proliferation of orchestrators, provided the operational overhead is less than the status quo and they can increase service and operational agility. This requires a level of standards and interoperability that the industry aspires to, but has yet to demonstrate.
- **Future-proof vNGN architecture:** We will have failed as an industry if we implement NFV and SDN technologies but do not radically improve service agility, operational efficiencies and innovation capabilities. vNGN architecture must be able to meet the challenges and requirements needed for 5G and beyond.

Software complexity is worse than hardware complexity. Orchestration was an important theme at the conference. All vendors were demonstrating their orchestrators, controllers and related network and service management solutions.

So far, the trend is for each vendor to develop an orchestration solution based on the vendor's technology heritage. This has led to a multitude of NFV and SDN orchestrators/controllers at almost all open system interconnection layers, namely layers one, two, three, four and seven.

Open source criticism

However, open source technology was criticised at the conference: vendors noted that OpenStack is immature, which will lead to vendors developing custom OpenStack commercial off-the-shelf versions in order to ensure orchestration progress.

The more orchestrators and controllers are enmeshed in a grid of horizontal domains and vertical layers, the greater will be the need to work out the interactions/integration and edges among them, particularly during the long network evolution cycle.

Each new significant technology introduced in the communications industry during the past 50 years, including IP, has fallen short of industry goals to revolutionise networking and sufficiently increase agility, efficiency and innovation. Complexity could similarly break NFV/SDN's promise.

It might be possible to keep vNGN operations simple by limiting orchestration to no more than two automated and well-integrated layers: a service orchestrator that is linked to the OSS, and a virtual network infrastructure orchestrator that is linked to the virtual infrastructure manager and creates virtual network functions and VNF managers that are monitored by the VIM.

These two orchestration layers will interface with each other to translate service logic into physical and virtual network configurations.

NFV and SDN are enablers to keep operators relevant to their customers. Operators and vendors want to increase their relevance to customers. Using NFV and SDN technology to rethink the way communications networks are built and managed is seen as key to achieving this.

Protect revenue

Operators want to be more relevant to their digital customers and protect revenue from over-the-top and alternative service providers. Vendors want to increase their relevance to operators and competitors by reinventing themselves and being more software-oriented.

It is imperative that operators and their vendors combine the best of the IT world — agility, cost-efficiency, a development and operations software- and application-centric approach — and the telecoms world, with solid technical standards and operational processes, a customer-centric approach, to strengthen their relevance in the evolving cloud-based, virtual digital economy with different digital consumers and business and delivery models.

Deutsche Telekom's Axel Clauberg noted at the plenary session of the conference that operators need reliability at the service level, not the box or functional level, if they want to harness the strengths of IT and telecoms and change the balance of power with OTT providers. Clauberg is vice president for aggregation, transport, IP and fixed access architecture.

The industry is working out how to move from the challenges of today to the NFV/SDN promise of being not just relevant but important in the digital economy of tomorrow, and the signs are that this work will yield promising results in the next three to five years. ■

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SDN puts the network onto the same pay-as-you-use model as the data centre, it's clear that's what the market wants, says Carl Grivner

SDN is a flexible, scalable service platform that lowers network costs



Carl Grivner: We can be something the market has never seen before

Although there's a lot of enthusiasm for and discussion about software defined networks (SDN) few operators have yet moved beyond the theoretical stage. Nevertheless, there is a substantial groundswell towards software-defined networking. Research firm Transparency Market Research has predicted that the global market for SDN is expected to reach \$3.52bn by 2018, growing at a CAGR of 61.5% from 2012 to 2018 and it concludes that this growth will be primarily driven by the increasing demand for cloud services.

Pacnet, the provider of managed data connectivity to operators, multinational enterprises and

governments, is an exception, having launched its Pacnet Enabled Network (PEN) in data centres throughout Australia, Hong Kong, Japan, Singapore and the US in February this year.

The PEN is a fully automated, software-defined network that provides a flexible and scalable service platform that is agile and delivers lower total cost of network operations. PEN enables enterprise and operator customers to rapidly and cost-effectively create the foundation of the virtual, integrated data centre, says Carl Grivner, the chief executive officer of Pacnet.

That capability has seen PEN generate significant interest from organisations in IT, logistics, manufacturing and financial services sectors in Australia, Singapore, Japan and Hong Kong, as well as the US. PEN allows customers to customise and configure their network resources based on performance and quality of service requirements under a flexible pricing model and industry-leading SLAs.

Through the PEN web-based GUI or Pacnet Connect, customers can provision network services between two locations in minutes without going through the traditional, long lead, manual provisioning process. PEN also enables customers to build network interconnects with bandwidth and

performance characteristics tailored to their unique business requirements.

"A year ago most operators were selling 10 gigabits of bandwidth at a specified price on one, two or three year contracts," Grivner explains. "Now, we're talking about a situation where you can buy a 10 gigabit wave for an hour."

PEN offers customers access to Pacnet's extensive network of data centres and major carriers, creating a virtualised, cross-connected Asia-Pacific ecosystem. It also has the capability to extend enterprise-class data centres and private clouds to any external cloud vendors with its OpenFlow-based software controller, offering customers the flexibility to instantly provision cloud compatible networks throughout the region and facilitate hybrid cloud deployment.

Pacnet will continue to expand PEN's availability on a global scale throughout the rest of the year — providing customers with scalable bandwidth, integrating software-enabled intelligence with Pacnet's network of data centres and undersea cable infrastructure.

Grivner says the industry's move to SDN is creating a market for bandwidth that is fluid and dynamic and is one that resembles the bandwidth trading exchange model that was unsuccessfully pioneered 15 years ago. Those trading exchanges failed because there was no incentive for operators to move away from the comfortable, long contract, fixed price model of selling capacity to enterprises and operators. Now though, the game has changed and customers want more than just bandwidth.

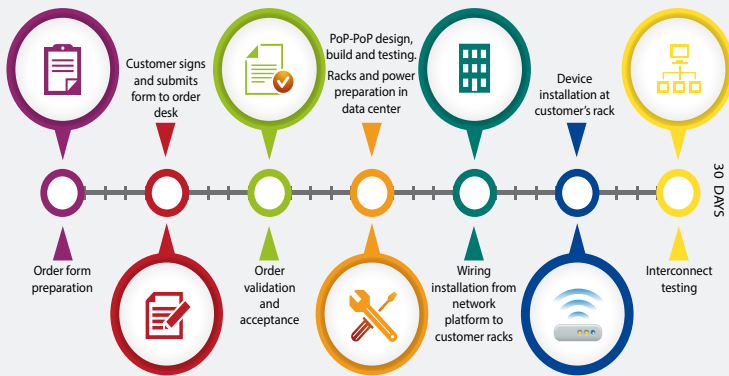
"Our history has been in subsea cable and we invested in cables across Asia and into the US to serve large enterprises and operators," acknowledges Grivner. "Over the last two years we've built and operated tier three data centres in Asia and have become a unique participant in the market because of our network and data centre capabilities."

Last year, Pacnet announced the successful deployment of an optical mesh network with 100 gigabit technology between Asia and the United States on its EAC Pacific fibre optic cable system integrated with Optical Transport Network (OTN) switching over its Asia-Pacific region's high-capacity submarine cable systems. Pacnet can now offer its carrier and enterprise customers 10, 40 or 100 gigabits per second services between Asia-Pacific and the US.

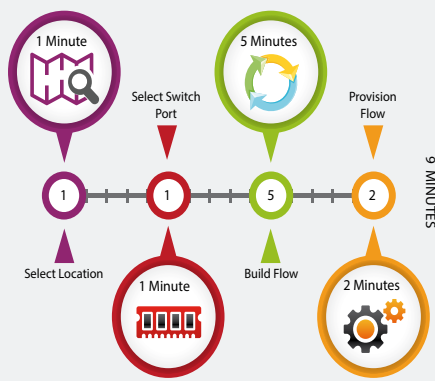
Grivner explains that the 100 gigabit network upgrade is a significant move to address the growing demand for bandwidth throughout the Asia-Pacific region and all over the world. The Cisco

DO YOU REALLY NEED TO WAIT FOR DAYS TO ORDER BANDWIDTH?

Traditional Bandwidth Provisioning Cycle → Complex, Manual, Takes Days



Pacnet Enabled Network → Simple, Automated, Within Minutes



Visual Networking Index: Forecast and Methodology, 2012–2017 predicts that in 2017, global IP traffic is expected to reach 1.4 zettabytes per year, or 120.6 exabytes per month, growing at a CAGR of 23% from 2012 to 2017. IP traffic in Asia-Pacific will reach 43.4 exabytes per month by 2017, at a CAGR of 26%.

To meet that need, Pacnet now has more than 46,000km of fibre and connectivity to interconnected data centres across 15 cities in the Asia-Pacific region. It's most recent tier three data centre opened in Tianjin in October 2014. The new facility provides SDN capability to give full network control to its customers to self-provision bandwidth on demand based on their business needs.

The tier three, 226,000-square-foot facility provides customers with colocation, connectivity and managed services backed by 24x7 expert, multilingual customer service and on-site remote hands support.

Customers locating in the Tianjin data centre also obtain direct access to major domestic exchanges, points of presence (PoPs) and diverse carrier networks within China. Tianjin is connected to the Beijing data centre of China International Data System (CIDS) via PEN and Pacnet plans to add further data centre capacity in Singapore, Hong Kong, Shanghai and in Japan during 2015.

Although the traditional telecoms business is going through a period of consolidation and continuing downward pressure on margins for traditional services, Grivner feels Pacnet's no longer a traditional

player. "People know us from that high redundancy, high capacity network proposition and see us now in the data centre market which has the same profile," he says. "As operators move into cloud the need for network and data centre capacity is bound to accelerate and we can provide both of those capabilities."

That may seem like a fairly straightforward extension into an adjacent market that has strong similarities but Pacnet is going further than just adding data centre capacity to its service portfolio. "We've moved past the traditional telco world into a new market," confirms Grivner. "With our SDN capability we can link all these pieces together throughout Asia and the world."

Pushing the pace of deployment of a new technology is not normally a recipe for success but Grivner is convinced of the transformative power of SDN and thinks the market is ready. "Having data centre experience makes it easier to move the network to SDN," he says. "SDN cloudifies the network and makes the network a cloud proposition. SDN puts the network in the same pay-per-drink model as the data centre and that's what the market is moving to."

Grivner is extending the PEN beyond Pacnet's own data centres and wants to create a global market of on-demand network and data centre capacity and services for customers. He does see the need for further market education but thinks the direction of travel towards virtualisation is already set.

"As far as we know, PEN is the only SDN capability that has been launched in the world, certainly it's the only one that's customer facing," he adds. "We're a pioneer and looking for relationships on the PEN capability and platform so, to an extent, we're evangelising the concept but we give flexibility and we are virtualising the network."

Markets are moving at different paces but Grivner feels being early is an advantage. "When we say we are this far down the path and ready to install security and other features into the network people pay attention," he says, pointing out that some markets will be ready in the short term. "Australia is probably going to be our strongest market in terms of early adopters of the technology."

However, Grivner is realistic about the rate of change. "From an expectation point of view it's going to take time because customers are not used to sharing this technology from a telecoms perspective," he explains. "They won't put their most sacred applications onto it at first but when customer recognises they can access our APIs and write their own code according to time and location, we think we can be something the market has never seen before."

Of course, the benefits of SDN are not only for customers. Grivner acknowledges that there are substantial cost benefits for Pacnet in moving to SDN. However, he argues these will pale into insignificance when compared to the new opportunities that open up. "There is an element of cost saving for us but the true value is in being a pioneer and entering into partnerships with multiple providers of cloud services," he concludes. "In doing that we'll tie PEN, not just to Pacnet's traditional capabilities, but also to a global network of data centre and network partners. That's when we'll really start to maximise the capabilities of PEN." ■

Operators are enthusiastic about deploying SDN but the benefits they'll reap in also mean the technology makes it easier for new entrants to offer telecoms services

Lowered barrier to entry means SDN benefits may not just be for operators

SDN, although long established in the data centre market, is starting to emerge into mainstream telecoms. It is early days but extending the virtualisation of the data centre into the network creates a more complete, virtualised or cloud environment that provides the flexibility that users want. Importantly, it enables operators to reduce costs.

Moving to a more IT-oriented than network-oriented technology base does present challenges for operators — and could be seen to erode the heritage of operators as providers of ultra-resilient services, as they replacing them with commodity IT hardware.

"I'd suggest it does quite the opposite," says Dan Pitt, the executive director of the Open Networking Foundation. "With SDN, operators are able to offer increasingly resilient services that can change and adapt to the needs of the business and its customers.

"The promise of open SDN is that networks are no longer locked, proprietary, and difficult to program. Software control is separated from transmission and switching equipment, freeing those technologies to evolve much more rapidly and reliably and enabling operators to focus on end-to-end quality of experience to subscribers."

He adds: "More importantly, SDN brings networking and telecoms into the world of software and online services, which has shown us that properly architected data centres and modern distributed-computing technologies — from which services are constructed — allow us to build hugely scalable and reliable services on basically unreliable but flexible and practically free computing hardware.

"The operators have to shed their five-nines per box mentality and become IT companies."

High resilience

Others disagree that operators will discard their heritage of high resilience as they move to SDN. "I don't think they will lose their traditional role because they provide the access and they own the customers," says Chris Buist, a director of Coleago Consulting.

"SDN and network functions virtualisation is going to enable operators to pick up more competitive attributes

because of the reduced cost, agility and flexibility it offers. At the same time, I accept the argument that SDN and NFV lower the barriers to entry so operators may gain competitors."

Buist says certain types of organisations, particularly in the enterprise sector, could take advantage of lowered barriers to entry and create their own connections and services.

"We could see new entrants becoming a greater threat, but SDN and NFV are making operators more efficient," he adds.

That convergence of IP and IT mentalities won't happen overnight but the benefits are likely to make the case for rapid deployment of SDN.

"By utilising SDN within network infrastructure, operators have an opportunity to provide more resilient services, make efficiency savings and create new revenue streams," says John Naylon, the CTO and founder of CBNL.

"As SDN does not rely on custom physical hardware, it can cut out long upgrade cycles, avoid difficulty in sourcing new parts and ensure a high quality of service is maintained."

He adds: "SDN also enables virtual networks to be created for specific services. CBNL has built point-to-multipoint microwave backhaul networks which maximise existing backhaul infrastructure by deploying additional fixed services to businesses. This releases under-utilised network resources which are typically locked away in rigid network infrastructure, and turns them into a revenue enabler."

Disruptive technology

That cost-saving business case is appealing and — along with the benefits of service flexibility and agility that SDN offers — the technology seems unavoidable for operators in spite of its disruptive nature. Operators will certainly find it a challenge to retrain their network-oriented staff but, given the likely long roll out of SDN and NFV, they have time to do it.

"I don't think there's any reluctance," says Buist. "There's a lot of enthusiasm frankly. Most operators see the issues of migrating to an IT approach but this is a transition rather than a revolution."

He adds: "That means there's time to retrain the workforce over time and a lot of the work will be done by the vendors. People recognise the issues but it's not staggeringly difficult to see how they will be overcome. It's very doable, which is why people are enthusiastic."

Naylon agrees and thinks the benefits make the case for operators to start moving towards virtualisation.

Dan Pitt: Operators have to shed their five-nines per box mentality and become IT companies



Chris Buist: Migrating to an IT approach but is a transition rather than a revolution



“The trend we have seen is that once operators are made aware of the benefits of SDN, they are keen to invest,” he says.

“Creating virtual networks across the same backhaul infrastructure enables operators to continually flex their mobile and fixed services to meet customer demand. This agility not only enables operators to launch new profitable services, but increases their competitive advantage and improves customer retention.

“The attractive business case SDN brings to network infrastructure has already sparked investment in a wide range of deployments across emerging and developed regions,” Naylor adds. “With the offer of reducing physical infrastructure costs and improving revenues, it’s easy to see why operators are embracing this trend.”

Service agility

For Pitt, the attraction is accelerated service agility, with opex saving as an additional benefit. “Most operators look to SDN to improve service agility and increase revenue velocity,” he says. “Most also

expect eventual opex savings, although not right away. A few focus on capex reduction, mostly in their data centres and via NFV, enabled by SDN.”

Pitt identifies three factors that could be seen as causing operators to hesitate before moving quickly to SDN. These are their large sunk investments in their proprietary, traditional networks; the absence of a full range of SDN equipment choices; and a lack of skills among their staff.

“Fortunately there is also a rapidly growing understanding of SDN’s benefits and an interest in moving forward

with future deployment,” emphasises Pitt. “In fact, the initial hype around SDN has settled down to the point that we are now seeing real-world implementations, and trials in most operators. In a few years, we have seen SDN rise from a research programme to the most transformative business and technology trend to hit the telecoms industry since the internet.”

The feeling, then, is generally positive. Operators don’t feel forced to adopt NFV and instead are exercising caution while being fully committed to SDN deployment.

“Operators are understandably cautious when embracing new technologies and change within their networks,” explains Naylor. “However, the industry can’t stand still and must look very seriously at the benefits SDN can bring if it’s to realise its growth potential. Although SDN is usually a topic in the packet core, we are also starting to see the benefits play out within the transmission network. We’ve seen first-hand in the backhaul networks we have deployed that SDN can make a positive impact, and we believe it won’t be long before it’s embraced across the network.”

Significant advance

For Pitt, it’s time for a change in the industry and he rates the move to NFV and SDN as a significant advance. “There is absolutely excitement around SDN’s potential, though sometimes it is caged in enthusiasm for NFV,” he says.

“Frankly, there hasn’t been much significant change in networking for quite some time — it’s just been business as usual — and this is a major advancement with direct benefits to businesses.

“Many operators are embracing SDN to remain viable and competitive with their services; the threats from the OTTs and the explosion of traffic without a concomitant increase in ARPU or decrease in equipment costs has a lot of telecom operators worried.”

He adds: “With the emergence of the internet of things, the networks will be experiencing an influx in data traffic from myriad new connected devices — wearables, connected cars, and smart appliances, just to name a few.

“It’s an exciting — and challenging — time for operators, as we start to see more connected devices join their networks. The coming of the age of IoT means that SDN will need to be implemented for subscriber retention, optimised QoE, network robustness and revenue growth. We are seeing the aggressive operators race to get first-mover advantage and retain the high-margin services, which basic connectivity is unlikely to remain.”

The enthusiasm is borne out by the large number of NFV trials and pilot projects that operators are engaged in. Buist is convinced that NFV comes first and logically brings in SDN later as projects mature.

“Most operators are trying to figure out what the business case is and what the optimal route to get there is,” adds Buist.

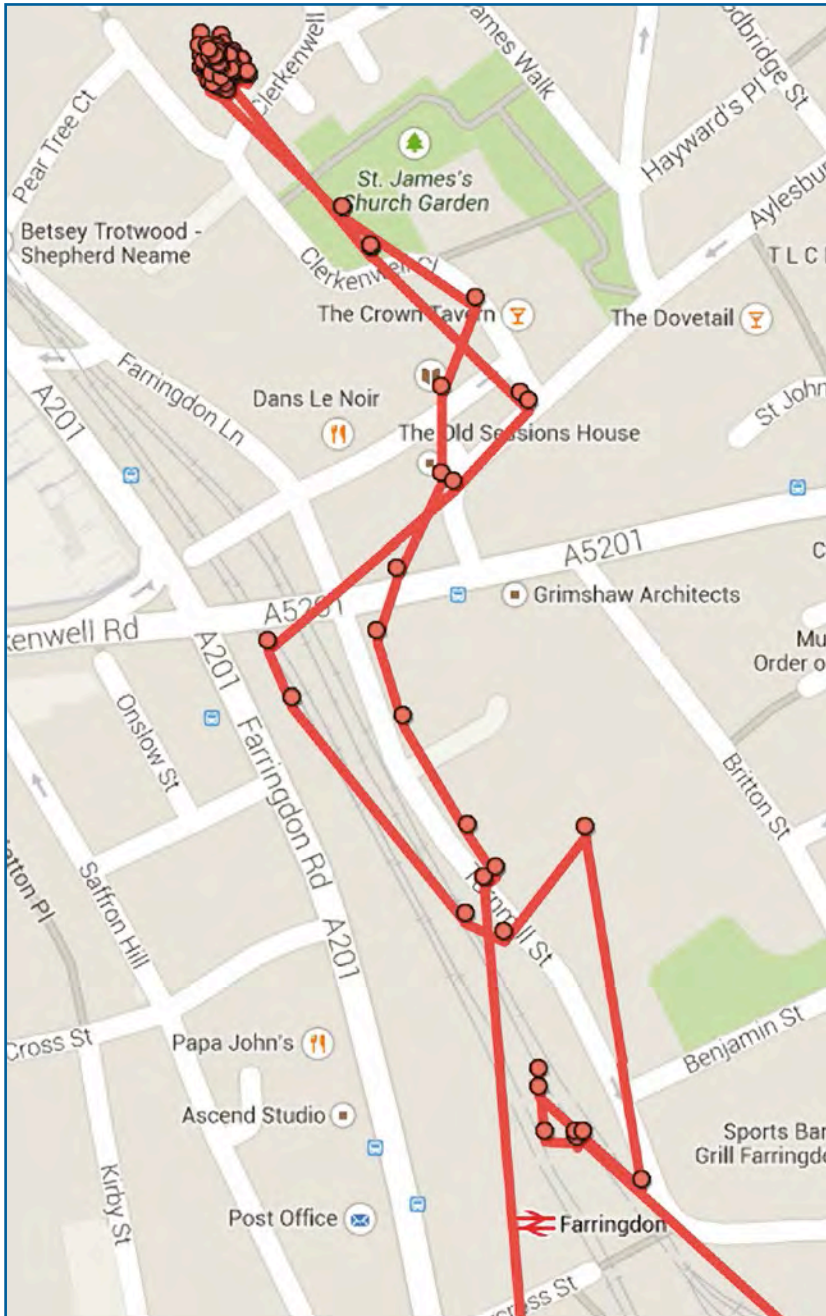
“Loads of operators are piloting NFV — more than SDN — with a view to doing both. I don’t think anybody can stand up today and say they’ve got it right, but it’s clear that NFV is a big enabler of SDN and benefits are accrued by doing both.” ■

John Naylor: Once operators are made aware of the benefits of SDN, they are keen to invest



Mobile advertising techniques that Steven Spielberg forecast for 2054 are here today but, writes Elizabeth Rose, advertisers and brands are slow to invest in the new technologies

Minority Report's technologies are available 40 years early, but advertisers lag behind



Google can trace a smartphone user's movements to within a few metres, but advertising professionals are slow to adopt location-based services

In Steven Spielberg's 2002 film *Minority Report* the protagonist, John Anderton, played by Tom Cruise, was bombarded with personalised ads from major brands such as Lexus and Guinness — calling out to him by name as he passed by.

The film predicted a world where technologies such as cellular connectivity, scanning and location are combined with big data to give brands the power to address potential customers at a time and place where

the brand is available and the target customer is most likely to convert.

While neither brands nor their loyal consumers would want the kind of invasive advertising depicted in this movie, technology can offer ways for brands to interact with customers on an opt-in basis to offer just the right products and services.

Though the movie was set in the year 2054, many of the technologies depicted in *Minority Report* are readily available today.

They offer almost endless possibilities for major brands to connect with their consumers in new and appealing ways, but we have yet to see brands investing in these technologies to the extent they invest in traditional media.

A 2014 study by Neilson found that only half of advertisers surveyed spent more than 10% of their budget on mobile advertising.

However, among those same respondents, advertisers cited "branding, with objectives such as driving awareness or influencing brand opinions" as the primary purpose of their mobile advertising campaigns.

Ad targeting and customer relationship management are commonplace in the world of online shopping. Data collected from recent online searches, basic demographics and location based on your IP address are combined in ever more sophisticated algorithms to determine which online ads to serve to you.

Amazon predictions

Anyone who has ever shopped on Amazon knows that each time you make a purchase, Amazon gets better and better at predicting the things you may want to buy next and offers you goods and services specifically targeted to you.

Geolocation capability is practically a ubiquitous feature on mobile phones. The Pew Institute reported in 2013 that "74% of adult smartphone owners aged 18 and older say they use their phone to get directions or other information based on their current location", and that "among adult social media users aged 18 and older, 30% say that at least one of their accounts is currently set up to include their location in their posts."

Increasingly, consumers are using location-based services on their mobile devices to find products and services at the exact time and place where they have a need, whether that means finding a bar or restaurant nearby or calling for a car service when you are ready to go home.

Product code scanning is a technology that has been around in the retail environment for decades. How-

Each time you make a purchase, Amazon gets better at predicting the things you may want to buy next and offers targeted goods

ever, only recently has the use of code scanning by consumers surpassed that of the employees stocking the shelves. It is now commonplace for consumers to use applications on their mobile phones to scan barcodes to find out more about a product before they buy or to search for mobile coupons.

Additionally, advertisers use QR codes on labels and print media to offer consumers instant access to special offers and in depth product data.

So if advertisers see the value in mobile for brands, and we have technologies such as geolocation and scanning readily available on virtually all smartphones, what is holding things back?

Reasons why we haven't seen a faster uptake in mobile advertising include — among others — the need for more experience in mobile among advertising professionals, reliability and ubiquity of LBS and control over data served via mobile scanning applications.

Tried and tested

The advertising industry is working to apply tried and tested return-on-investment metrics to mobile, and only time will produce advertising executives with mobile experience. However, there are international standards being developed to make sure that brands can serve up their mobile campaigns with accurate location and product information.



Elizabeth Rose: Only time will produce advertising executives with mobile advertising experience

Standards produced by organisations such as the Open Geospatial Consortium and the Open Mobile Alliance are increasing the ubiquity and reliability of mapping and location. In particular, the OMA's secure user plane location is a specification being developed to allow location-based services to be supported across a variety of networks including fixed broadband, all major mobile networks and wifi.

Version 3.0 of secure user plane location also supports a variety of positioning protocols and positioning methods. What this means for major brands is the increased capability of smartphones to accurately serve up location-based ads both indoors and outdoors in most countries in the world.

The OMA is working with GS1 — whose system of standards for barcodes is using in the supply chain — is working with OMA to develop a new specification using both organisations' standards.

Barcode scanning

The specification will allow manufacturers and operators to build mobile devices with some key barcode scanning capabilities. These will include cameras on devices with built-in scanning capabilities and mobile applications and support for collection of user analytics including location on an opt-in basis.

More importantly there will be intelligent linking of barcodes with trusted content provided by owners, meaning brands can be assured their customers are getting the right information

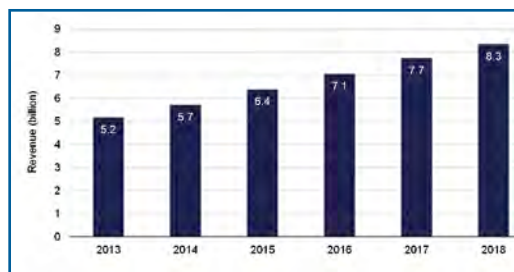
Thanks to the work of standards organisations such as OMA, OGC and GS1, our phones can tell us where we can find that Guinness in an underground mall in Japan or when driving through a small town in Mexico. What's more, mobile codes can give us information straight from the brand about our favourite products and services.

As advertisers learn more about our individual habits, wants and needs while on the go — and with mobile location and scanning technologies in place — we can expect mobile advertising to increasingly be a part of our lives. ■

Elizabeth Rose is communications director at the Open Mobile Alliance

The SDP market is growing at 10% a year, write Glen Ragoonanan and Gorkem Yigit, as operators use them enable the delivery of services, from traditional voice to multi-screen video and VoLTE

SDPs crucial to create sticky personalised services in the new digital economy



Worldwide service delivery platform revenue, 2013-18 [Source: Analysys Mason, 2014]

Operators are looking for ways to reap the benefits of their expensive network infrastructure investments through innovative services, while simultaneously competing with over-the-top players to prevent erosion of their established revenue streams.

Service delivery platforms play an important role in protecting current revenue streams and creating new ones by helping operators to develop, deliver and manage new and established services and charging models. SDP solutions enable the delivery of a wide spectrum of telecoms services, ranging from traditional voice and messaging services to new and high-growth services such as multi-screen video and VoLTE.

The SDP market will grow from \$5.2 billion in 2013 to \$8.3 billion in 2018, at a compound annual growth rate of 10%, according to our latest report on the topic — see chart.

CSPs are investing in voice over LTE, unified communications and the internet of things/machine-to-machine services to remain relevant in the new digital economy.

Voice and messaging revenue is declining in most parts of the world, and access to the revenue from OTT services and other third-party applications is becoming increasingly important for service providers' top and bottom lines. To remain relevant and competitive in this new market landscape, service providers are replacing their closed, complex and costly legacy service platforms with next-generation open environments that improve service agility, reduce costs and enable service exposure.

Voice over LTE

Operators will need to spend on telecoms application servers to support VoLTE, the replacement of legacy intelligent networks, and new IoT/M2M and unified communications platforms during the next five years. VoLTE deployments started to gain momentum in most developed markets in 2013, and are expected to have a larger impact on the market in 2014 and onwards.

Spending on multi-screen video services is increasing as operators strive to compete with cable and OTT providers. Operators are investing in video content management and delivery solutions to enhance their IPTV services with multi-screen capabilities, which enable their users to consume content on mobile devices such as smartphones and tablets.

This is a response to competition from cable and OTT providers, as consumer demand shifts to personalised video services that can be consumed

anytime and anywhere. Analytics-enabled targeted and contextual mobile advertising solutions are also becoming popular as operators aim to monetise increasing mobile device take-up and data usage.

Operators face increasing pressure to deliver bandwidth-intensive content to multiple devices via their congested networks.

Mobile networks pose further challenges to operators as rapid growth in mobile data traffic squeezes their limited network capacity. This is increasing the demand for video optimisation solutions in content delivery networks to maximise the availability and performance of services and ensure customer satisfaction and loyalty.

Customer experience

Personalised services will help operators to improve the customer experience and create new revenue streams.

Subscriber data management solutions are crucial elements that support the execution of services by providing real-time and near-real-time access to subscriber data. Operators continue to deploy and expand home subscriber server systems, driven by LTE roll-outs and expansions, as well as growth in their subscriber bases.

Vendors are upgrading and replacing end-of-life subscriber data management with new solutions equivalent to the user data repository in 3GPP's user data convergence architecture for unified subscriber data. Operators began to adopt these solutions mostly for internal use cases, such as using analytics and customer experience management to reduce costs and gain incremental revenue.

However, more operators are likely to implement subscriber data management in the near future in a bid to improve the customer experience, and to monetise rich customer and network data through collaboration with third-party service providers and partner ecosystems, such as identity management solutions, internet of things/M2M services and mobile advertising.

Policy management solutions are moving beyond traffic management to revenue-generating use cases. Rapid growth in mobile data usage is driving the adoption of numerous policy management use cases — such as network protection, bill-shock prevention, tiered pricing and family/shared plans — to monetise this traffic through new services and charging models while reducing the network cost per bit.

Application-based pricing, which is the inclusion of third-party content and services — or applications — as part of an operator's tariff structures, has gained popularity in recent years as service providers try to maintain revenue per user against the decline in mobile data prices and per-user spending on digital content. ■

Glen Ragoonanan is the lead analyst for Analysys Mason's infrastructure solutions, service delivery platforms and software-controlled networking research programmes and Gorkem Yigit is part of the telecoms software research team, contributing to the service assurance, infrastructure solutions, service delivery platforms and customer experience management programmes www.analysismason.com

CEO and CFO Guide to IPX — introduction

As operators continue into their fifth year of rolling out 4G, coverage for 4G roamers still lags far behind that of 3G. In fact, at current rates of deployment it could take a further decade for 4G mobile roaming to match 3G. By that time we will have entered the 5G arena.

However, in recent months operators are starting to commit greater attention to 4G roaming. They are starting to recognise that providing 4G customers with 3G or lesser capacity when they travel abroad has a strongly negative affect on the customer experience and is detrimental to revenue generation.

Part of the challenge is the shift to Diameter as the signalling protocol for 4G. That is now fairly well addressed and operators are bringing Diameter roaming services to market. Those services will run on IPX networks. It looks likely that Diameter roaming services could turn out to be the catalyst for accelerated adoption of IPXs themselves.

Most IPX providers are relatively large operator groups who have been earliest to market in order to serve the needs of their group properties to interconnect 4G in their domestic markets as well as to facilitate cross border roaming. However, some independent roaming providers exist and claim to have large numbers of operators signed up to their exchanges.

The IPX principle hinges on having a minimised number of hops so support of a Dutch customer roaming in Singapore can be managed by the local operator connecting to the IPX which interconnects with the user's home operator. It's a simple principle of a one-to-many relationship. The concept is that an operator will only need to be a member of a few IPXs to be able to connect to any operator in the world.

It is however likely that traditional, bilateral roaming agreements will remain in place between providers that have a lot of reciprocal traffic so smaller operators potentially see more value in IPXs than large groups that have long standing relationships with each other that can be readily re-written for the 4G era.

Of course, IPX isn't just for 4G roaming. Operators are able to apply different class of service parameters from the handset to the application and can assign priorities for traffic carried on the network. That ability to differentiate class of service creates a significant cost reduction opportunity for operators in terms of network optimisation and wholesale pricing.



Photo: Vodafone Deutschland

As the world's networks gradually move to all-IP, a transition to IPX for international interconnections seems logical. But it's taking longer than expected, heard a recent i3forum conference

IPX operators put their trust in growth of LTE roaming and voice over LTE

It's a remarkable seven years since the all-IP world was sufficiently advanced for a group of operators to feel the time was right to set up the i3forum. The aim was to make it easier for all carriers to transition to an all-IP world, focusing on international interconnections.

Today, the i3forum has 51 members, from Airtel and BT to Verizon and Vodafone, including fixed and mobile operators as well as essentially wholesale service providers.

Philippe Millet, chairman of the i3forum, told its recent annual gathering that the forum's focus has been on IPX — which stands for IP packet exchange, a generic term that refers to IP-based interconnection models and implementations that share a number of characteristics.

At the same time in the mobile industry the GSM Association has been following its own IP interconnection agenda. It has set out two key goals that it believes will enable all stakeholders to make a viable business in the IP era: seamless interoperability of IP services between all types of operators delivering secure, high quality service interworking; and commercial and technical frameworks that enable all parties in the interworking value chain to receive a fair commercial return.

Working with operators, the GSMA has developed a managed IP network solution called the IP exchange or IPX — rather than IP packet exchange; the GSMA leaves out the word “packet” — that provides the commercial and technical solutions to manage IP traffic.

It follows the GSMA's four key principles that are seen as vital for a successful and sustainable IP

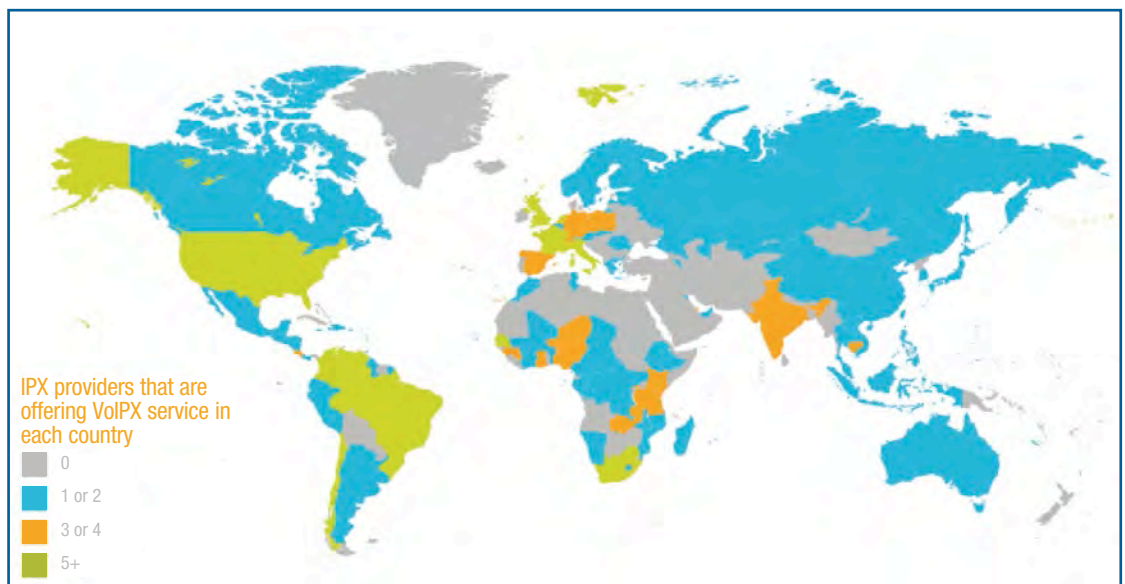
interworking solution: openness, quality, cascading payments and efficient connectivity.

The IPX is an interconnect service that is offered by a variety of carriers on a competitive basis but with common agreed technical specifications and using consistent commercial models. The managed network environment is traffic engineered to support specific IP services at specific quality levels.

The GSMA describes its IPX solution as a premium quality solution that promises error free delivery of traffic while offering the flexibility to apply an appropriate level of quality as demanded by each different class of service.

For service providers and users alike, security is of vital importance, says the GSMA. The commercial and technical design of the IPX has been developed and tested to offer a great deal of protection on many fronts.

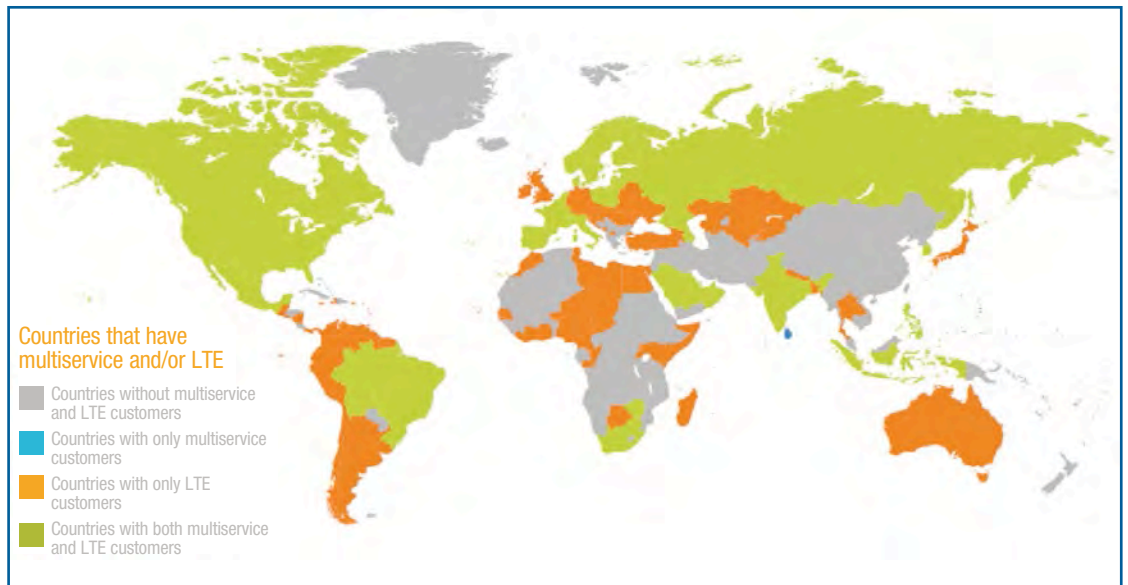
- Commercial agreements give protection to all players — those connected to the IPX agree to sign up to a security code of conduct and a trusted community is created.
 - The IPX is not addressable from the internet — which makes attacks much more difficult
 - Individual operator traffic is segregated — thus localising any security breaches
 - End user terminals have no visibility of the IPX — so they are unable to probe the core networks involved in the management and delivery of the IP services
- The i3forum also believes in the use of private IP domain, spanning from service provider to service provider, with no use of the public internet. Its view is that IPX should be:



Voice over IPX is growing: some countries already have more than five IPX providers.
Source: i3forum

Continuing expansion of LTE is the new driver of IPX. Many countries now have multiservice and LTE providers.

Source: i3forum



- multi-service capable — with implementation of multi-service offers as a commercial matter;
- designed and operated to support high quality IP based services — with break-outs and break-ins to and from non-IPX services possible and disclosed.

IPX allows a cascading business model, says i3forum; it guarantees service assurance across the whole IPX domain, being SLA capable — so that SLAs can be offered, though actual implementation is a commercial matter — and secure: MPLS based though other techniques can be used. IPX should also be scalable, as opposed to dedicated bilateral private IP interconnects.

IPX services are offered by international IPX providers to service providers, and IPX providers can interconnect among themselves in order to guarantee a worldwide coverage.

Alessandro Forcina of Telecom Italia Sparkle, told the i3forum meeting that the wholesale industry is in the middle of a transition from the TDM world to the IP world, but that the transition was slower than expected. Wholesale carriers are ahead of mobile and fixed network operators, he added.

He contrasted IP migration via the public internet with the preferred option. On the public internet, quality of service is not guaranteed, he said, and security could be an issue. In most of the cases, there is one contract for one service via one port. The alternative means that quality of service is guaranteed, security is guaranteed — with separation from the public internet — and there are multiservice agreements via one port with established business models.

He warned, though, that there have been multiple announcements proposing different models, offering different services with different capabilities. Forcina argued that there had so far been weak demand from the mobile industry, delaying investments in IP migration. There was weak demand for some capabilities requested from the GSMA, he added, but extra push was expected as LTE is deployed.

IPX is one way of implementing the IP migration, he said, but it is the only one based on a standardised framework.

He quoted GSMA forecasts that, by 2017, there will be 270 up to 500 LTE networks in operation across 128 countries, covering between then 20-50% of the world's population. LTE connections will rise from 176 million — nearly 3% of the total mobile connections in 2014 — to a billion, nearly 13% of total mobile connections.

But progress will happen when there is a demand for LTE data roaming, and mobile network operators request wholesale carriers and IPX providers to implement this on behalf of their customers.

Unfortunately Forcina's analysis seems to suggest there are a number of imponderables. Rich communications services, or RCS, were once thought to be a potential spur to IPX. Services such as Joyn, backed by the GSMA, have had some success in Asia: "No real take-off," he noted. There may be a demand for RCS hubbing in the future.

Voice over LTE is another possibility. At the moment LTE terminals resort to circuit-switched 3G for voice calls, losing the ability to use IP. When VoLTE is delivered, there will still be the need to resort to traditional 3G when no 4G is available. This technology, single radio voice call continuity, is very complex.

Operators have committed to using SRVCC in LTE, in South Korea, Hong Kong, Japan, China and the US — but it's still unknown what the thresholds will be in terms of LTE network coverage and LTE customer population that will push an operator to implement SRVCC.

And video, long touted as a driver of services even back in the early days of 3G? There is no service and no market request for the time being, says Forcina, apart from corporate videoconferencing.

In any case when LTE is a market reality, the service will be free. But then there will be interoperability questions with over-the-top video services. Meanwhile, over-the-top providers have shown little interest in IPX, he suggested.

It's clear that the industry is behind IPX. As telecoms moves to all-IP, it will be an inevitable transition. Unfortunately, the inevitable needs to be paid for, and at the moment it's not clear how that will happen. ■

Teams in most service providers have different cultures and working alone in terms of communication channels, budget and tools. It's time to change, writes Cédric Arnaud-Battandier

Business transformation to better serve the customer

Mobile broadband traffic is growing fast. Smartphones and tablets are selling well, hundreds of new exciting applications are launched every day and the M2M market future looks promising. Reaching customer quality expectations while managing traffic growth and network performance cost efficiently is extremely challenging for mobile network operators.

While addressing growing bandwidth requirements across heterogeneous networks, it is equally important for operators to understand which services — such as Facebook, Skype and Netflix — as well as devices and customers are driving this change in order to improve the customer experience, adapt the focus of network investments, deliver differentiated offers and power marketing campaigns.

Breaking the silos

Due to the increased pressures on capital and operational expenditure, operators are looking for solutions to improve network efficiency and minimise network lifecycle related costs.

Operators therefore need to develop and increase their competencies continuously in order to guarantee good communications between the different stakeholders — departments such as network operations and engineering, marketing and commercial, and customer service.

However, most operators are operating in silo-based organisations, with each team having a different culture and working autonomously in terms of communication channels, budget and tools.

The different tools each team is using are only providing a partial vision of the network and the subscriber experience. Marketers for instance rely mainly on data from billing and CRM systems along with studies, polling and focus groups. To get a holistic view of the customer experience, they should not only work with bill-

ing and CRM data but also with information coming from the network.

For marketers it is important to know who is using which services on which device, when and where in order to develop upsell promotions and services to the right customers. This information can be used to increase usage or to tackle churn by presenting alternative tariff plans or a device upgrade.

This data intelligence is available in the network but unfortunately marketing is not always aware of it. A recent study commissioned by Astellia shows that almost 60% of marketers do not think they have the right data or tools — such as specific information about quality of experience and service usage — to make informed business decisions.

Equally, customer services staff need tools that provide a good understanding of any problem experienced by any dissatisfied subscriber to allow them to reduce the average handling time per call and increase first call resolution rate.

At a glimpse, they should be able to see on a map where a problem occurred and diagnose if this problem is affecting one or many subscribers.

However, customer services are using a multitude of tools — sometimes even more than 20 different tools — in order to treat a customer complaint and even all these tools together do not always provide a complete picture of the customer experience and encountered problems.

Join forces, pool and customise tools

In a time where average revenue per user is decreasing and margins are diminishing, operators have to optimise investments and processes. Acquiring and maintaining multiple tools and associated training costs are weighing too heavily on their budgets.

Different departments are relying on the same data but have different processing and data visualisation needs. It is therefore highly recommended that they should join forces, pool and customise tools. This allows combining of budgets and will facilitate inter-departmental communication, thereby gaining in efficiency and providing an overview of the customer experience and journey throughout the entire organisation.

To make things work, different departments will have to work together, break the existing silo structure by adapting processes and communication channels and share budgets and tools.

This organisational change can be driven by a so-called service operational centre, a horizontal division allowing all vertical departments to work closely together. It will also be driven by a customer-centric tool which provides network-based data, unifying the internal language all whilst focusing on the customer experience. ■

Cédric Arnaud-Battandier is chief marketing officer of Astellia

Cédric Arnaud-Battandier:
The different tools each team
is using are only providing a
partial vision of the network and
the subscriber experience



Although 4G was first deployed five years ago, international roaming lags behind, potentially limiting the experience for users and throttling revenues for operators

Diameter Roaming Exchange services are a catalyst to attract operators to IPX networks



Bernd Hoogkamp: We can mirror our IPX platform so the capex burden is taken away from the mobile operator

4G, when it was first launched by TeliaSonera in Sweden in 2009, brought with it a radically changed market that provided ever more bandwidth to users to fuel the consumption of applications and content on feature rich smartphones. For users in their home markets the experience delivered by 4G was a step change from 3G.

However, moving from 3G to 4G ushered in an all-IP environment and a change in signalling protocol. An impact for operators has been the need to enable international roaming because traditional roaming exchanges cannot be readily replicated for 4G. Added to that, the 4G environment involves a more complex blend of services and applications with different quality requirements to be taken into account.

IP exchanges – or IPX – have become the means to address the need for global 4G roaming because they enable one operator to connect to many in a minimised number of hops. However, there have been challenges in creating technical understanding of IPX and the impact of the shift to the Diameter signalling protocol with 4G.

The move to Diameter is no longer a technological challenge and most operators have moved to an IPX hub that offers a Diameter signalling service. If a user roams to GSM standards, Diameter is essential so it has become the industry standard for 4G roaming. However, the universality of Diameter has meant that providers of Diameter Roaming Exchanges are looking to do more than simply hand-off the traffic.

“We provide the interconnection between our group mobile operators and other clients and the groups they want to reach to – we’re the intermediary,” explains Bernd Hoogkamp, the director of product management, for voice and mobile at TeliaSonera International Carrier.

“Most of our competitors will have a Diameter Roaming Exchange that is at least compatible with the GSM standards but we wanted to add value-added services. We can basically mirror our platform in such a way that the capex burden of investing in their own Diameter Agents is taken away from the mobile network operator. The engineering, set up and maintenance is all done by TeliaSonera International Carrier.”

That’s appealing because most operators don’t want to invest time and money into creating their own platforms in the kind of unnecessary, capex intensive re-invention of the wheel that the industry has been working to eradicate. Instead, joining an IPX network that already exists and interconnects with many other operators globally and being able to use the value-added services it offers such as TeliaSonera International Carrier’s Diameter Roaming Exchange, shifts capex to opex and accelerates time to market.

A further benefit of an IPX network and the services it enables is that operators do not want to re-establish fully meshed roaming – bilateral operator relationships – again in the 4G world. “It’s an absolute necessity to establish 4G roaming between mobile operators,” adds Hoogkamp. “The criticality of Diameter within that is well understood.”

Moving customers from traditional roaming exchanges to IPX has not been a challenge for TeliaSonera because it has been able to demonstrate the benefits of the IPX approach. In addition, as the first operator to launch 4G services it was early to market. “We don’t give customers the choice of a [traditional] global roaming exchange (GRX),” says Hoogkamp. “We phased out our GRX network and built our new IPX on top of our own waves. We then layered on products like Diameter and run the GRX as a service on our IPX network. This gives customers better control and allows us to offer better quality of service.”

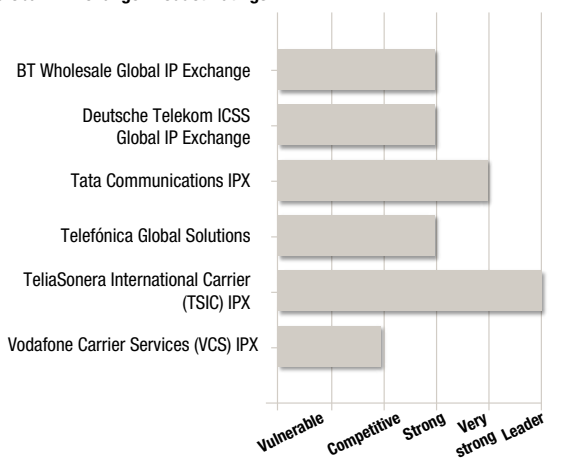
“With more than 61,500km of fibre, we’re perfectly placed to provide a one hop fibre link from Los Angeles to Madrid, for example,” he adds. “Diameter will be one of the services to run over IPX but it’s definitely the catalyst service to attract customers to use IPX.”

Nevertheless some confusion still remains about what IPX is – and what it isn’t. In addition, there are conflicting usages of the term IPX to describe services that aren’t necessarily true descriptions of what IPX is or its capabilities. In order to educate the market and clear up the confusion, TeliaSonera International Carrier established the website www.whatisipx.com in 2013.

“It’s very interesting to see in our What Is IPX? blog that the technology-related articles are the ones that are most read,” Hoogkamp says. “People are still interested to see our technical definition of IPX and the technological solutions we chose. In general, the understanding is improving but one of the misconceptions is that IPX is the service. It is not, IPX is the network the services are Diameter and others on top of the IPX network.”

“We have a lot of usage of whatisipx.com and we keep adding content, not only from TeliaSonera International Carrier, but from industry commentators and operators who feel the need to contribute and demystify IPX further,” adds Hoogkamp. ■

Global IP Exchange Product Ratings



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www.whatisipx.com

LTE roaming has created the need to exchange IP traffic in a quality-aware, controlled and secure way. It has become the catalyst for IPX, writes George Malim

IPX enables operators meet users' 4G experience demands when they roam

With the proliferation of service types proliferating, it's clear that the traditional bilateral approach will be too time consuming and too complex to sustain on an operator-to-operator basis.

IP exchange, or IPX, is being seen as a potential solution. The IPX concept enables the quality-aware transmission of IP traffic through multiple providers' networks with each fairly compensated along the way.

However, many large operators will continue to manage traffic using long-established bilateral or reciprocal agreements.

"The turning point is being reached in the IPX market," says Mikael Schachne, the vice president of the mobile data roaming business at BICS. "The industry has been discussing it for ten years."

Interworking solutions for IMS and SIP have been tried, but there has never been "massive take-up", he adds.

"Now the world has embraced LTE, we see the whole mobile community supporting the establishment of a brand new, worldwide, interconnection environment such as IPX," he adds.

"That's because they see the need to exchange IP traffic at top quality and in a controlled and secure way."

Cross-border LTE

And as customers are promised the benefits of LTE, they will want to cross borders and still enjoy them, he notes.

Traditional roaming exchanges will continue to operate alongside IPX for LTE roaming.

"In the move towards LTE, mobile data roaming services supported by GPRS will be superseded by Diameter for signalling and IPX for data packet exchange," explains BJ Neal, the vice president of network strategy for mobile transaction services at global IPX provider, Syniverse.

"IPX provides a significantly enhanced GRX networking model, which will eventually replace the GPRS roaming exchange (GRX) because GRX provides a transport-only interconnection service between mobile operators on a bilateral basis, with no end-to-end quality of service guarantee.

"In particular, IPX supports bilateral and multi-lateral roaming and interconnection relationships, and it ensures the end-to-end quality-of-service and class-of-service connectivity that enables the seamless, high-speed experiences of LTE."

IPX is unlikely to have an effect on existing arrangements for 2G and 3G roaming. "We don't think GPRS roaming itself will really change," says Stefan Amon, the director of wholesale for Telekom

Austria Group. "There won't be an immediate switch from 2G and 3G to LTE — it could take five to ten years but at the moment we don't know."

He adds: "What is clear is the phasing out will take time and with 5G arriving in around 2020 I'd estimate the scenario is about ten years away. The move to IPX does start with LTE, everything starts with LTE, it's definitely the catalyst."

Schachne concurs: "The 2.5G and 3G service will be there for a very, very long time," he says.

"There will still be many places without LTE and operators will continue to provide 2G and 3G services which will continue to be supported through global roaming exchanges. In order to provide very high speed data at home and abroad, operators cannot rely on the GRX network so the two networks — GRX and IPX — will co-exist for a long time to come."

Bilateral agreements

IPX is also unlikely to replace traditional bilateral agreements. "Commercial agreements are still being done bilaterally with some providers proposing to establish some of the agreements through roaming hubs," says Schachne.

"Bilateral agreements are being signed by operators where interconnection is established through the IPX."

Neal thinks bilateral agreement will continue between operators that hand off significant volumes of roaming traffic to each other. What may change is that IPX may be used as an enabling network to achieve this.

"Bilateral relationships are advantageous for managing commercial roaming and interconnection relationships in situations where significant volumes of traffic are being exchanged between roaming partners," he says.

"While mobile network operators may wish to retain bilateral commercial relationships, IPX is still a critical element for managing IP routing and managing end-to-end quality-of-service and class-of-service parameters. Under such circumstances, while billing and financial settlement may be managed independently, using the IPX ensures that connectivity still operates within defined GSMA IP interworking principles."

He adds: "IPX's support of bilateral and multi-lateral models potentially eliminates the need for multiple agreements between roaming partners because an IPX hubbing environment doesn't require a commercial relationship between the mobile network operators exchanging traffic.

Hubbing functions

"Service-based charging for hubbing functions, as well as charging for IPX transport, can be managed



Stefan Amon: IPX means you can decide when and where and at what quality a package should arrive



BJ Neal: IPX supports the end-to-end quality-of-service that enables the high-speed experiences of LTE



Mikael Schachne: The promise of LTE will not be realized unless users can cross a border and still enjoy it.

using a single agreement between the mobile network operator and its IPX provider.”

Bilateral deals could continue simply because the industry is so familiar with them. “Bilateral agreements will continue because they are the way that the industry has worked for so many years and you can’t change such a long-lasting business model from day one to day two,” says Amon.

“We’ll have to add something to existing bilateral agreements to take account of the cost of providing different classes of quality in LTE, though. That hasn’t been addressed and in future the cost will not only be quantity-based, There will also be a quality-based component.”

It’s in the new business cases and opportunities it enables that IPX makes the strongest case for itself based on cost efficiency and greater flexibility.

“IPX is compelling because it means you can steer your business in a completely different way,” explains Amon. “You can decide when and where and at what quality a package should arrive. That means you can make specific offers to customer such as guaranteeing a particular quality level for SAP traffic which is extremely important to enterprise users.”

The value-added opportunities are extensive, says Schachne. “We’ve developed a whole set of value-added services to help operators get more visibility and control of roaming services to enable them to boost profitability and increase quality of services.

“We’ve developed a business intelligence environment called Smart Webvision to help enhance the user experience and operators’ business performance.”

He adds: “We have roaming control capabilities to help operators prevent bill shock or launch specific marketing campaigns to mobile subscribers. These will result in decreasing the number of silent roamers and increase operator revenues.

Voice over LTE

“We’re seeing very rapid take up of LTE roaming. As soon as an operator opens up LTE roaming relationships we see a surge in traffic. We see LTE signalling traffic almost doubling every month which is a very encouraging sign for mobile traffic. In addition the market is getting ready for voice over LTE.”

For Neal, the ability of IPX to enable operators to set class of service is the key benefit of IPX although cost benefits also exist.

“Mobile operators that are able to apply differentiated class-of-service parameters — from the handset, through LTE, across the IPX and all the way to the application — can assign priorities for traffic carried on the network,” he says. “The ability to differentiate services presents a significant cost reduction opportunity for service providers in terms of network optimisation, as well as end-customer pricing and wholesale pricing arrangements.”

Others see IPX helping the wider development of IT and IT services. “IPX will be integral to the development of how IT will work in the future,” Amon says. “The transmission part can help to offer the quality a particular application needs. It also enables operators to make very tailored offerings to OTT providers. Whatever they need you can design on IPX.”

Schachne sees acceleration in demand for IPX caused by the need for LTE roaming happening now. “LTE roaming over IPX is a very big challenge because we need to connect every single IP network in the world to the IPX,” he says. “We need to get LTE roaming relationships established one by one. Massive work is being done right now.”

Challenges to the roll-out of IPX continue to exist. Those are partly to do with a lingering lack of understanding of what IPX can achieve and what it is.

“As a small wholesale operator one of the questions we always have to tackle from customers is whether we really have the large IPX reach that we claim,” acknowledges Amon. “The answer is yes, we are very large in the IPX business. You don’t have to be a big wholesale provider to have an IPX network, it’s about reach.”

“There is this marketing that suggests it’s important to have direct links in IPX but for the quality of the service that’s irrelevant,” he adds.

“That confuses people who do not have deep knowledge of the topic. It’s not necessary to ask about direct links or the number of hops because that doesn’t affect quality as long as the IPX is GSMA-compliant, that’s the most important point.” ■

Customers are demanding the same LTE enabled experiences as they get at home when they roam but sustained investment is required to make LTE roaming a reality

Quality-aware LTE roaming raises the stakes for operators as they invest to meet user expectations



Stefan Amon: Additional regulation will have an immediate effect on how LTE roaming is rolled out because if you don't make enough money, you cannot make any necessary investments

“What is clear is you need high quality international, global connectivity to provide LTE roaming.”

Five years after the initial launch of LTE, there are now more than 263 LTE operators in more than 97 countries according to figures from the GSA. That has made LTE roaming become a real demand as LTE users want the same experiences they receive in their home markets when they travel. Smartphones have enabled users with a vast array of content and applications from entertainment to social media and users want all of these experiences at the same quality when they roam.

However, to support LTE roaming a new basis for roaming is required. This is partly because with LTE the market has moved to Diameter signalling which means traditional global roaming exchanges are no longer fit for purpose. There is also added complexity to consider in relation to the different bands being used by operators for LTE in different countries.

However, for Stefan Amon, director of Wholesale at Telekom Austria Group, the biggest issue is the sheer speed at which new LTE operators are being established and wanting to enable roaming for their customers.

“The main challenge is the number of networks which is growing really fast,” he confirms. “Everybody would like to offer LTE roaming to their customers because once you’ve used LTE, you use it all the time.”

No operator wants to see their users throttled back to 3G or lower bandwidth mobile technologies when they roam because there is a risk of creating dissatisfied customers and it is likely to cause a user to seek out wifi off their operator’s network.

Operators have options to consider. They can seek, in the traditional way, to construct a series of roaming relationships for LTE with other operators and effectively build their own roaming platform or they can engage with a wholesale provider who can enable them to provide roaming in many markets.

“The thing to consider is whether it makes sense to build everything or to buy it,” says Amon. “It depends upon how large the mobile network operator is and, even if they have resources, not every investment makes sense. It’s not worth building a roaming relationship with a market in which you have only a limited number of roamers, for example.”

Amon points out that approaches to LTE roaming are far from set. “With LTE roaming we’re in a new infrastructure so it’s a learning phase for everybody,” he says. “What is clear is you need high quality international, global connectivity to provide LTE roaming.”

To an extent, operators are engaged in a race to add new LTE roaming markets to their portfolios. Once an operator offers LTE it wants to offer it everywhere. “We’re focused on quick time to market,” says Amon. “We’re a premium brand and we want our customers to have these experiences in every market. We have 39 countries with LTE roaming ready and, from an industry benchmark perspective, that puts us very ahead.”

However, the challenge isn’t just about completing the land grab. The migration to LTE has created a new signalling environment based on a new protocol, Diameter. Knowledge of that is critical but for smaller operators the resource isn’t always there. Wholesale providers can step in and offer Diameter signalling as a service.

“We have a lot of experience as a signalling provider and were very active in driving how this new system was developed,” explains Amon. “I’m responsible for offering about 23 million customers LTE capability and within Telekom Austria Group we have test markets that enable us to develop offerings before we bring them to another mobile network operator.”

That early identification of the likely demand for LTE roaming and the Group’s portfolio of operators made it an easy decision for Telekom Austria Group to invest in creating its platform for LTE roaming. The intention was always to offer this as a wholesale capability to other operators as well as to support the group’s own units.

“We were thinking about how to approach the market and investigated with a consulting company how to build a real market or business case to determine what makes sense for individual operators,” adds Amon. “We now offer a technology service on one side and also a consulting service. We send our people to very large Asian operators to share our knowledge of how to do this, for example.”

Therefore LTE roaming must be, and has been designed to be, quality aware.

“Assuring the customer experience is getting more challenging because LTE allows for different classes of quality of service,” says Amon. “Each must be delivered in a very, very correct way. Our customers have great quality all over the currently available LTE coverage and with LTE and IPX you can guarantee quality of service for roamers.”

“This leads to completely new possibilities in terms of providing customer satisfaction and removing the need for customers to switch to wifi resulting in lost revenue for operators,” he adds. “Customers will ask why services they expected didn’t work when they roamed so, like everything in roaming, it’s vital that you choose the right partners.”

Partner selection can make the difference, argues Amon. “Transport traffic is very dependent on how the [partner] operator is positioned in its country,” he says. “If it’s a low budget brand it will provide a different experience compared to a high quality provider and that’s what your customers will receive.”

All of this has and will continue to require sustained investment from operators and wholesale providers but Amon is concerned that regulators are not doing enough to ensure operators can make a clear business case for the large-scale investment that is required.

“The question of what impact European Commission pressure on roaming prices will have on LTE roaming business models has not been answered yet,” he confirms. “We really don’t know yet what the implications are. The only thing that is clear is that minutes will be megabits in future.”

“Sooner or later roaming regulation will come and it should not threaten the ability of operators to invest in and roll-out LTE roaming. It should enable operators to find a sustainable business case for the substantial investments that they are required to make to meet the demands of consumers.”

LTE roaming isn’t just about making existing LTE users have the same experience as they do at home when they travel. LTE roaming also provides an opportunity for users with LTE-enabled devices to use LTE networks when they roam, even if they don’t have LTE at home. It’s an opportunity for the domestic operator to seed the market for LTE at home by getting roamers familiar with LTE. In addition, it enables them to derive revenue from high-bandwidth services from their roamers.

Amon certainly sees these users as an opportunity. “The iPhone6 and Galaxy S5 are 4G devices so the handsets are in the market even where operators only have 3G,” he says. “Customers from those markets can use LTE in Austria, Slovenia, Croatia and others, so this is definitely a business opportunity.”

LTE roaming is a far more complex proposition in terms of managing the customer experience than previous types of roaming. That’s partly because users expect so much more but also because many of the applications and services are quality-dependent.

“The industry can’t afford further regulation after the cuts in roaming revenues in recent years,” he adds. “Another hard cut will have an immediate effect on how LTE roaming is rolled out because if you have no cash, you can’t invest. This is not reflected in the European debate but operators can only employ so many people and invest in this if they can generate cash. This must be reflected in the future model.”

Amon denies that LTE roaming could see another wave of bill shock stories and says the market has matured to the extent that heavy-handed regulation is unnecessary. “Bill shock has nothing to do with LTE,” he says. “Operators have implemented mechanisms and checks to eradicate bill shock and I really think the market has already a lot of measures in place. Sooner or later roaming regulation will come and it should not threaten the ability of operators to invest in and roll-out LTE roaming. It should enable operators to find a sustainable business case for the substantial investments that they are required to make to meet the demands of consumers.” ■

Operators initially felt 3G would be enough for roamers, but lost revenues and unhappy customers have made 4G roaming a key performance indicator, writes George Malim

User expectations drive operators to make 4G roaming a priority

Although 4G has now been deployed for more than five years, international 4G roaming remains an inconsistent experience. There are now almost 350 live LTE networks in 101 countries according to the GSA, an association that gathers data from suppliers.

In telecoms terms that's rapid deployment — but there are many situations in which 4G users in their home markets are routinely handed off to 3G or even Edge networks when they go abroad, even to markets that have well-established 4G coverage.

Conversely, there are situations in which roamers who don't have 4G access at home but do have a 4G enabled smartphone are provided with access to 4G capacity when they travel.

The 3G operator providing 4G to its customers when they roam is deriving additional revenue and delighting its customers with a better than expected experience and a preview of what 4G will bring when it arrives to their home market. The operator that

lives through their mobile devices. Consider developments in smartphones since the introduction of 3G and it's clear that the range of essential communications and applications on devices are critical to users. Add to that, the nice-to-haves such as streaming video, that users are familiar with in their home markets and it's easy to see how users can become dis-satisfied.

Against that backdrop, the stakes for operators are higher because a bad experience abroad can result in a user changing their provider when they get home.

Attempting to get away with only providing 3G roaming therefore won't be enough and is seen by customers as a downgrade. The move to 4G has seen domestic data volumes double and, as one operator executive recently explained, switching from 4G to 3G "just feels like wading through glue".

Yet, five years into 4G deployment, the current project completion rates for 4G roaming suggest it could take ten years to get to 3G levels of roaming. With 5G

“Enabling 4G roaming in itself does not mean an operator is providing a good customer experience. That experience depends on how good the coverage and capacity of the visited operator.”

thinks it's sufficient that its roaming partner in a 4G country only provides Edge network capacity will miss out on revenue and hasten the users' rush to find free wifi as an alternative.

It's a double blow because they'll lose revenue and fall down on key performance indicators for customer experience.

Lost or unearned revenue is a disaster for operators. Silent roamers, those that toggle off roaming when they go abroad in order to evade the type of bill shock stories that beset the industry five years ago, result in operators earning no revenue and users running their communications through wifi services. Those users need to be educated that 4G roaming can be done at a predictable cost, with high quality and in a controlled manner.

The revenue issue, though, may be less acute than the customer experience one for senior operator executives because users are increasingly demanding the same experience they receive at home when they travel. This is different from the experience when 3G was rolling out and expectations of the new technology were relatively low.

With 4G, though, high-bandwidth access has become an expectation for users who routinely run their entire

expected to emerge around 2020, roaming capability will fall still further behind user expectations.

Some are seeing indications that the pace of 4G roaming deployment is accelerating and services such as Diameter Roaming Exchanges will help to accelerate that. It may be a typical case of operators being cautious and waiting for the technology to mature, as it has been doing in the IPX arena, before fully committing to fast roll-out. Alternatively, it may be that operators are now clearly seeing the user expectation-led demand for 4G roaming and have been forced to react.

An important warning is that enabling 4G roaming in itself does not mean an operator is providing a good customer experience. That experience depends on how good the coverage and capacity of the visited operator is and that's why it is so important that operators have a choice of roaming partners for 4G available.

Operators are starting to take the concept of choice on board and the number of roaming partners is being seen as a key performance indicator by C-level executives. That KPI isn't about the technical intricacies of IPX, it's about identifying gaps in the portfolio that can result in lost revenues and poor customer satisfaction — and no operator can afford either of those. ■

The economics of telecoms, defined by the industry itself, have given way to the economics of the digital world, writes Chris Lewis. The industry is being absorbed into the broader digital economy

Growth becomes a rare commodity as operators face OTT offerings and competition from peers



Growth in telecoms has become a rarer and rarer commodity

In the boom years of the telecoms industry, the economics were straightforward: the more connections and the more traffic generated, the more revenue. As markets got liberalised and mobile was added to the fixed networks, overall revenue benefited from a series of premiums, whether that was an unexpected bonus like SMS or new business service on the fixed network, or broadband on the mobile network.

As I have tracked the evolution of the telecoms industry over the last 30 years, I have become increasingly aware that growth is

becoming a rarer and rarer commodity, apart from in terms of traffic. The economics of telecoms, defined by the industry itself, have given way to the economics of the digital world.

I no longer show charts with the telecoms market value in the current year and in five years' time, but I show the state of the market today and talk about telecoms being absorbed into the broader digital economy. And each of the major revenue segments is being challenged by either OTT offerings or threatened by competition from peers.

There is a little growth at the global level when lumping fixed and mobile, voice and data together, but this is mainly due to the final throes of growth coming out of the emerging markets. The so-called mature Western markets are either already in decline or about to drop into decline.

The good news is that the \$1.6 trillion total spend is a big pot to play with, whatever the combination of fixed, mobile, voice and data. The bad news is that there is a lot more competition to bring together the digital building blocks for consumers and businesses alike.

The emphasis is switching from the suppliers and their unique positioning, to the demand side and what the customers want to do with the formerly unique technology components.

Is there a single answer to who is going to win and who is going to make the money? Digital, by

definition, brings together formerly separate supply and value chains. In discussions around cloud over the last 10 years, the analyst community has been a battleground between the compute, networking and applications camps.

Each believes it holds the upper hand in the future marketplace. Economists are no different, many schools of thought exist around the digital future:

- The digital optimists, Erik Brynjolfsson and Andrew McAfee, of "The Second Machine Age" believe digital creates vast opportunities of new apps, business flows and economic activity;

- The digital pessimists, Larry Summers and Robert Gordon of MIT, believe digital breaks down barriers and destroys value in existing value chains.

Inevitably, of course, both have some element of truth and the reality will compose of a proportion of each.

From the end-customer side, the ability to bundle together formerly separate services and get a better price for committing to a single provider is self-evident. Bringing together a household's fixed broadband, television package, possibly fixed phone, and mobiles makes absolute domestic financial sense. In fact, why hasn't my provider already offered me a family plan to that effect, sharing data, text and voice minutes across the varying consumption patterns of my wife, my teenage children and myself?

On the supply side, formerly separate lines of business now combine to build the digital services we all want to consume at home and at work. Hierarchical and siloed systems do not lend themselves to bringing all of these pieces together technically, let alone commercially.

The temptation, as telecoms revenues flatten and shrink, is to venture into the adjacent markets and include media and business ICT offerings. Unfortunately, commoditisation and virtualisation are also impacting those sectors, and they are venturing onto the telecoms patch.

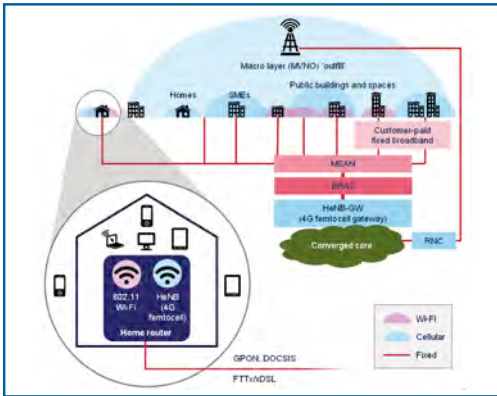
The laws of demand and supply will increasingly kick in as barriers to the different markets come down. Technology-based players will no longer be able to hide behind the complexity of technology but must hide it, and expose the personal and business benefits of their solution.

And, as these digital value chains mingle, formerly self-contained industries become embedded into the digital future. Networking, compute and software are all vital components but they must now work much more closely together. Resources can be drawn upon from the cloud to support a value proposition, whether that be watching a movie, engaging in omnichannel collaboration for retail, or executing the end-of-month financial reporting. ■

Industry analyst Chris Lewis is with Lewis Insight

Hetnets could be successful and profitable for fixed operators, as well as disruptive to legacy mobile operators. Rupert Wood looks at the challenges

Inside every fixed operator there is a mobile operator trying to get out



The basic inside-out wireless network [Source: Analysys Mason, 2014]

What is being described as an inside-out approach gives fixed operators a way to transform their voice services, but there are many challenges.

The approach offers real cost savings over classic mobile virtual network models, and as such Analysys Mason believes it could be successful and profitable, as well as disruptive to legacy mobile operators.

In the inside-out model

small-cell backhaul generates revenue, not cost. It also offers an attractive way for fixed operators to transform and rejuvenate their voice services and to escape the deflationary spirals associated with fixed voice-over-broadband and with multi-service access nodes, both of which leave the end user with the dismal home phone.

The inside-out approach involves mostly fixed or cable operators building vast national public heterogeneous networks, or hetnets, by crowd-sourcing wifi access points and licensed small cells — mainly consumer-grade femtocells sitting in home routers and enterprise picocells — from fixed broadband subscribers.

All cells and access points operate in open-access mode — an extension of the Fon principle into the hetnet — and additional capacity for areas with no coverage, or outfill, is provided on a wholesale basis by a mobile operator.

Analysys Mason’s new strategy report, Inside-out wireless networks for fixed operators: the technical and commercial challenges of HetNets, analyses in depth the business case for inside-out transformation.

There are many challenges and critical dependencies associated with the inside-out approach.

The approach depends on a high level of currently mobile voice and data traffic being in addressable locations, mainly indoors. This is true for voice, but in some countries, notably in Europe, most at-home data traffic from mobile devices is already on wifi.

It also depends on mobile voice being overpriced. Again, this is true, at least in relation to the production costs, but mobile voice revenue is tumbling.

Real technical issues need addressing, mainly arising from the unplanned growth of plug-and-play small cells. Self-organising networking offers solutions, but it is still an immature technology. Femtocells need licensed spectrum, but only a few fixed or cable operators already have suitable spectrum.

When the ecosystem matures, it is likely that the

3.5 gigahertz band will prove a suitable vehicle for inside-out operators.

There are alternative — and lower-cost — fixed-mobile convergence approaches for voice, including simple voice-over-wifi apps without cellular handover, and voice-over-wifi-enabled handsets that support handover. Femtocells offer a number of genuine advantages, but fixed and cable operators need to achieve scale to reduce consumer-grade femtocell module costs.

The commercial challenges for fixed and cable operators are mainly around distribution, the balance between wholesale costs and retail pricing, and achieving scale.

Operators such as BT and Liberty Global, though large, currently have little scale in device distribution. They could outsource, go web-only or simply offer SIM-only deals, but this may limit their market share.

Inside-out operators need something akin to national roaming agreements or even a flexible mobile IP bitstream model rather than the crude but familiar MVNO structures. They will need a host network that will prioritise the immediate wholesale revenue over the long-term potential for disruption.

Inside-out mobile will cannibalise legacy fixed voice, and while operators should be bold with pricing, they are constrained by the accelerated loss of a moribund service.

The approach is potentially less expensive than fixed operators buying directly into mobile. Inside-out is the converse of a current trend for mobile operators — not only in Europe — to buy into fixed broadband access. Being a mainstream mostly-mobile operator, particularly in Europe, is not an enviable position given current and forecast revenue trends and the growth of quadruple-play offers.

Buying directly into mobile is sometimes an option for fixed and cable operators — for example, Altice buying SFR or the merger of Optimus into ZON — but the targets are usually financially distressed operators at the bottom of the market.

Inside-out is potentially less expensive, and contrasts even more with the moves by hitherto mobile operators such as Vodafone into fixed, either through top-of-the-market acquisitions or through capital-intensive build-out of fibre-to-the-home.

Inside-out is, in the final analysis, just one way towards a converged world based on millions of small cells and where the role of the traditional tower-based macrocell is more marginal.

Fixed and cable operators have a real current cost advantage over mobile operators working outside-in, but massive mesh networking in 5G may come to challenge the view that it is always best to get mobile data onto a fixed fibre link as quickly as possible. ■

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CEO and CFO Guide to Cloud — introduction



Photo: Deutsche Telekom

As their traditional revenues continue to commoditise, operators have been targeting the cloud as a potential source of new revenues. Their efforts in this direction range from massive, strategic re-alignments to speculative activity, usually undertaken in partnership, to offer a limited portfolio of services to a subset of the subscriber base.

Commodity services such as secure storage and basic office applications are being packaged up by operators themselves, by independent software vendors or by IT service providers to be sold to small businesses. Often the operator provides the channel to market for all these providers, earning revenue share along the way.

That's probably the simplest and most rapid approach for operators. They can quickly offer the SMB subset of their subscriber base an attractive package of relevant software and services. The software

providers find a new channel to market and the SMB feels confidence in the operator's brand and the existing billing relationship between them and their operator.

However, whilst there is additional revenue to be made from doing this it will not be substantial enough to become a major line of business that fills operators' revenue gaps.

The more ambitious are taking on greater risk in the expectation of greater reward. Large operator groups have made multi-billion dollar investments in cloud assets, in retraining staff and in building the relationships necessary to become cloud service providers, as opposed to cloud service enablers.

By doing so, the revenue potential is greater but these approaches are yet to be proven to be successful. Operators have tried to enter new markets before with little

success. Part of the reason for that is that they continue to enter new markets with a telecoms mindset.

They invest billions and take up to two years to fully test, prepare and launch a new, highly resilient service. Competing web companies launch in a few weeks with a service that may only be 80% ready. Their gamble is that most customers find that acceptable for most of the time. Besides, they'll have plenty of time to develop the proposition to perform better once it's deployed.

Operators though run the risk in taking such a long time to develop propositions that they are obsolete at launch. They need to adopt a web services mindset instead of developing services for the needs of today's market for launch in 2016. The needs of the market will be different then and the investment may turn out to have been wasted while once again other types of company take the market.

As the industry moves towards more and more use of cloud services, the Open Data Center Alliance is leading development of standards for providers and users

Alliance works to promote unified voice as industry starts migration to cloud services



Deutsche Telekom and Verizon — as well as major users — are among the members of the Open Data Center Alliance

The Open Data Center Alliance was formed four years ago as a consortium of leading global IT organisations dedicated to accelerating adoption of interoperable solutions and services for cloud computing.

The ODCA works with enterprise IT as well as the providers of cloud products and services to ensure availability of a choice of solutions and services meeting the alliance's requirements in the marketplace.

The leadership of the ODCA includes senior IT executives from BMW, China Unicom, Deutsche Bank, Deutsche Telekom, Dis-

ney, Infosys, NTT Data, SAP and Verizon.

The purpose of the organisation is to deliver a unified voice for emerging data centre and cloud computing requirements and to speed the migration to cloud computing by fostering an ecosystem built on openness and interoperability.

There are several levels to the alliance's programme:

- helping to align cloud service providers with customers by identifying customer requirements for cloud adoption;
- developing usage models based on best practices that help customers quickly integrate cloud services;
- influencing industry innovation;
- facilitating service and solution selection through ODCA tools and resources;
- promoting available services and solutions through ODCA programmes;
- sharing deployment best practice stories to help leverage insight to a wide variety of enterprises.

The ODCA is committed to accelerating the deployment of cloud solutions and services. The potential benefits for enterprise adoption of cloud computing are enormous, increasing IT agility and providing new levels of organisational efficiency.

The end result is more time spent innovating IT solutions that create competitive advantage.

As the ODCA puts it, cloud computing is the industry term for delivering hosted services over a network or the internet. It treats computing as a service rather

than a product, enabling users to access and share a wide variety of applications, data, and resources through an interface such as their web browser.

Cloud computing requires a paradigm shift in infrastructure management. Instead of local PCs running individual applications, cloud IT services tap a distributed network of computers that may reside in multiple locations yet appear as a single resource on the front end. In cloud infrastructure solutions, everything becomes a software service — applications, data, and storage — and APIs are the building blocks. Obviously, security on the cloud is critical for both businesses and users.

In 2011, the Alliance began its work of defining requirements for cloud adoption at a global level with the publication of 11 usage models. Since then, the ODCA has continued its work of paving the path for enterprises to accelerate cloud deployments by publishing master usage models, new usage models, and constantly updating the content that has already been published.

Driven by the unified voice of its enterprise members, the ODCA master usage models and usage models focus on the most pressing challenges and needed solutions for cloud deployment, and have shaped the planning and purchasing of solutions and services for many of its members.

The ODCA says that the goal of cloud computing is to provide easy, scalable access to computer resources and services. The potential benefits for enterprise adoption of cloud services are huge and include:

- decreased infrastructure costs;
- reduced time to market;
- flexibility in infrastructure investments beyond today's virtualization solutions;
- ability to rapidly adopt and apply game-changing technologies;
- enhanced partnering opportunities due to increased business interoperability;
- full compatibility with the trend away from PCs to portable and purpose-specific devices.

Cloud IT services are usually divided into three categories:

Infrastructure as a Service: These cloud services offer configurable virtual servers and storage, and companies or individual users pay for the capacity they use, which can fluctuate as needed.

Platform as a Service: The capability provided to the consumer is to deploy onto the cloud infrastructure consumer-created or acquired applications created using programming languages, libraries, services, and tools supported by the provider. The consumer does not manage or control the underlying cloud

infrastructure including network, servers, operating systems, or storage, but has control over the deployed applications and possibly configuration settings for the application-hosting environment.

Software as a Service: Here, the host provides everything — infrastructure, software, data storage, and the user interface. Because everything is in the cloud, users can access the services from anywhere.

There are also different access models for clouds: Some are internal (private), some external (public), and some are a combination of both (community, hybrid).

A private cloud is a proprietary network or data centre that supplies hosted services to an organization over an intranet — behind a firewall. It may be hosted on-site or outsourced, and managed by the company's IT team or a third party.

Private clouds enable IT managers to install and maintain applications centrally rather than on each person's PC.

In a public cloud, the infrastructure and services are made available to the general public over the internet, usually by an organisation selling cloud services. Public clouds generally have intuitive front ends so that anyone can use the services without needing technical skills.

A community cloud is shared by several organisations with common concerns, such as mission objectives, security requirements, policy, and compliance considerations.

A hybrid cloud is a composition of two or more clouds — private, public or community — that remain distinct entities but are bound together by standardised or proprietary technology that enables data and application portability.

Infrastructure as a service is the most fundamental cloud service model and is divided into three different offerings: compute, storage, and network. Each can exist in a variety of usage models. With IaaS, providers provision virtual machines and other resources, such as object storage, virtual networking, or software bundles.

There is also compute infrastructure as a service (CIaaS), the general purpose cloud computing container, often including the necessary network and storage capabilities to make it useful. Given the broad range of cloud consumers and their compute infrastructure requirements, it is not possible for service providers to meet all possible permutations of demand and capabilities.

In order to meet this variety of requirements, the ODCA has developed a framework around which CIaaS products can be defined, provisioned, monitored, and managed. This results in consistent capabilities and services across providers while still allowing innovation.

Cloud storage solutions come in many usage scenarios. Typically, they use a scale-out approach, in which adding capacity or increasing performance is efficient and nondisruptive to business practices.

Software-defined networking (SDN) and network functions virtualisation (NFV) are two related sets of network management technologies that play a crucial role in IaaS solutions. These services address many crucial problems associated with migrating existing network technologies to IaaS products.

Platform as a service allows an enterprise to do more with limited resources. However, careful choices still need to be made to ensure that deployments are not constrained by poor scalability, lack of interoperability, or vendor lock-in. A properly architected cloud application can be ported to multiple providers to allow for global reach, a clearer growth path, and future flexibility.

Finding the right PaaS product is crucial to successful adoption and deployment. The ODCA has developed a PaaS interoperability usage model to guide the creation of requests for proposals for PaaS solutions users are looking for.

The choice between a PaaS and an IaaS solution can be made clear with the right information. They both can be a part of the long-term strategy of the enterprise.

With software as a service, entire applications are deployed on-demand in the cloud. This offers enterprises a cost-effective alternative to the purchasing, support, and maintenance of traditional application infrastructure. SaaS has been core to the success of many well-known products, delivering a range of solutions from email to enterprise resource planning.

Organizations using SaaS desire interoperability across methods and services. The ODCA's SaaS interoperability usage model helps enterprises determine what characteristics they should consider when evaluating SaaS.

It provides models for enterprise IT to create RFPs that ensure complete coverage and interoperability across services. The ODCA's requirements also pave the path for the next generation of best practices, encouraging open standards and greater interoperability.

Information as a Service — or InfoaaS — is a major advancement in managing enterprise data.

As big data and cloud computing exponentially increase the amount and types of available data, the time that businesses have to translate this data into real-time information has become compressed. Organisations are turning to InfoaaS for standardised methods to create, manage, exchange and extract meaningful information.

With InfoaaS, enterprise information services are available for consumption by any application. High-quality solutions address the technical barriers and time constraints of sharing data between systems.

Moving from traditional data management models to InfoaaS can seem like an unreachable ideal. Making all data sources available, consistent and consumable across a large enterprise is a daunting goal. The requirements and best practices ODCA has created make adoption of enterprise-wide cloud data services a plausible reality.

Since InfoaaS makes enterprise data sources more available and consumable, data security becomes a critical issue. ODCA members have worked together to understand the data security challenges facing InfoaaS deployments with its data security framework.

Data security for cloud services requires a new approach and carefully chosen solutions. It is particularly vital to InfoaaS solutions because of the scope of enterprise data involved. ■

Cloud is generally seen as a way to cut costs and gain flexibility, but, in the carrier-to-carrier market, it's simply just the next step in the evolution of OSS and BSS systems for operators large and small

Cloud and big data – the next generation for the carrier-to-carrier business



Neal Axelrad: Running OSS and BSS in the cloud reduces TCO, simplifies operations and expands global opportunities

Operators are moving towards cloud-based OSS and BSS solutions as a means to reduce costs, gain flexibility and increase agility in response to the dynamic nature of the carrier-to-carrier market. While operators are cautious about committing mission critical functions to third party managed cloud environments, they understand the obvious benefits that are available to them via the cloud.

“It’s happening and, as with any new technology introduction, it starts with the smaller and more nimble players that haven’t invested as much in their own infrastructure,” says Neal Axelrad, the chief executive of Global Convergence Solutions, which provides the GCS Dynamic Solutions suite to operators to give them software capabilities to streamline and improve their inter-carrier voice business.

“Over the last three years, we’ve seen the interest and momentum increase dramatically,” says Axelrad. “In 2012, primarily tier three carriers were interested in cloud-based OSS and BSS solutions. As we enter 2015, tier one and two operators are beginning to explore cloud-based solutions. We believe that trend is only going to continue and accelerate. They’re interested in it, they’re considering it and they’re analysing it.”

Axelrad explains that as operators transform their businesses they are moving to private and public cloud based infrastructure. This transformation will extend beyond provision of services to their customers to include critical network functions such as routing, rating and billing.

“There is no technological or commercial reason that cloud-based infrastructure can’t be or shouldn’t be used for these functions,” confirms Axelrad. “The perceived risk in the cloud is just that, a perceived risk. There’s nothing that can be accomplished on the carrier’s premise that can’t be accomplished in the cloud. This frees operators up to focus on the services they provide and use a wider set of tools and capabilities in their OSS and BSS systems to maximise the value of their propositions.”

Cloud is obvious, but what about big data?

The big data trend that is sweeping across virtually every industry has been confronting operators since the first telecoms service was established. Cloud based solutions do nothing to degrade big data performance and, in many instances, big data solutions are improved when running in the cloud.

“Any OSS/BSS system that seeks to provide value must be able to ingest enormous amounts of data and produce results that are usable,” he says. “The amount of data required to effectively manage inter-carrier voice has more than doubled from what it was even five years ago. There is enormous value and trapped opportunity to be found within these data sets that are substantial and we intend to help carriers find it, analyse it and act upon it.”

“Carriers were used to having, at most, only a few dozen interconnects that they routed calls to and from. Now, in order to remain competitive, they need to successfully manage hundreds or even thousands. As a result, they will have to intelligently process and get actionable information from the billions of bits of data they process every week and they need this information now, not tomorrow or in three days or, in some cases next week,” Axelrad adds. “Traditional OSS and BSS systems simply weren’t designed to deal with the massive amount of information carriers process every day.”

The impact that big data imposes is extremely disruptive to existing operator relationships, but it is a reality of the 2015 inter-carrier marketplace and operators need their OSS and BSS solution providers to help them contend with the sheer volume. It's what will help the operators successfully contend with the dynamic nature of the marketplace.

"This is an interesting challenge and opportunity that the next generation marketplace has enabled," confirms Axelrad. "With next gen OSS and BSS solutions, managing an interconnect in the carrier-to-carrier world becomes much easier; you can easily exchange commercial information and commence the exchange of traffic in one-hundredth of the time. The challenge is how do you manage the exchange of the information and, simultaneously ensure traffic flows?"

More nimble rivals to the larger operators have identified, invested in and are enjoying the benefits of a cloud-based OSS and BSS solution that can support the big data challenges that today's marketplace imposes.

"We're enabling companies to extract a vast amount of business from the marketplace at a fraction of the cost of these large operators," says Axelrad. "Eventually, the large operator is going to have to make the investment in next gen OSS and BSS tools that help them run their day-to-day inter-carrier voice business. The longer they wait, the more market share they end up ceding to these smaller companies that don't own or operate anywhere near the size of the large operator's network but, because they have an array of next gen tools and capabilities at their disposal, they oper-

That chicken and egg situation is opening the door for alternative providers who can meet the needs of the market to come in. "Companies like us are coming in and saying this is available now — today," says Axelrad.

GCS customers include some larger operators such as iBasis, the wholesale carrier owned by KPN. It became a GCS customer because of the lower total cost of ownership and the faster time to market offered in comparison to developing its own solution. "We were able to be up and running in weeks and deliver real value and ROI to them in a matter of weeks, not months," adds Axelrad.

The marketplace is finally beginning to respond. The more traditional OSS/BSS providers have launched or are beginning to launch next generation solutions, or acquiring companies that have developed them. But, Axelrad contends, the next generation requirements are revolutionary rather than evolutionary and that is presenting some real challenges to these traditional solution providers.

That may seem uncomfortable for operators and their OSS/BSS vendors that have spent decades in the traditional telecoms market, operating through the TDM lifecycle, yet it is the new market reality.

"Cloud is the natural next step," says Axelrad. "The market is evolving from the legacy TDM mindset and design that dominated the last 25 years of telecoms operations to the next generation. Cloud is the logical progression. That's why everything is moving towards cloud."

"Next Gen OSS and BSS solutions are a critical component of a carrier's day-to-day operations. Cloud makes it easier to deploy, less expensive and future proof. Its not a question of if a carrier will deploy a cloud based solution, its only a question of when."

ate more intelligently than their larger peers. This is allowing them to capture a disproportionate amount of market share at a fraction of the operating cost."

Axelrad adds: "Simply put, if you're a large operator you need the tools in order to compete. You have to be able to handle the data, intelligently in real-time."

It's clear that in addition to the traditional relationships of the carrier-to-carrier market being changed, the systems that support it will also have to be upgraded.

"The traditional OSS/BSS solution space suffers from the same inertia challenges that any new technology adoption faces when it is significantly different to what has come before," explains Axelrad. "Operators have made enormous investments in these legacy back office systems and are looking to evolve them at the same pace that the tier one market has been evolving and continues to evolve at. The tier one carriers are looking to their existing OSS/BSS providers to tell them how fast to evolve and their OSS/BSS providers are waiting for demand to emerge. It's the typical chicken or egg dilemma. But it's this dilemma that has allowed GCS to thrive and succeed at unprecedented levels."

"We thought it would take longer than it has, but the quality, reliability and ubiquity of cloud based infrastructure has accelerated at a pace that has outstripped everyone's expectations," he concludes pointing out that GCS now gets one-third of its revenues from its cloud-based solutions and expects to hit 50% cloud-based revenue by the end of 2015. The trend will continue and Axelrad predicts 75-80% of GCS revenues will be cloud-based by the end of 2016.

The good news for GCS and its customers is that it started investing in cloud solutions more than three years ago. GCS recently completed a migration to the latest infrastructure technologies and will continue to ensure that its cloud infrastructure is meeting the demand from the marketplace while providing all the capabilities and reliability necessary to meet operators' needs well into the future.

Axelrad concludes: "Next Gen OSS and BSS solutions are a critical component of a carrier's day-to-day operations. Cloud makes it easier to deploy, less expensive and future proof. Its not a question of if a carrier will deploy a cloud based solution, its only a question of when." ■



Operators have been struggling to become cloud service providers, but perhaps they should focus on enabling provision of cloud services to their customers. Additional revenues are there, writes George Malim

Operators' route to revenue is clearer in cloud enablement than in cloud service provision

Operators see cloud service provision as a means to offset the decline in revenues in their traditional offerings. However, operators have come to market with their traditional mindset of carefully developing and testing a set of highly resilient services.

The problem is that this has often taken so long that the market has moved on and the opportunity no longer exists by the time such services have come to market.

In the meantime, web companies have been fast to launch services that are not always completely ready for market but are close enough in terms of satisfying consumers. Time and again operators have missed out on markets — even though services have relied on their networks for delivery.

As cloud services hit the mainstream, operators are starting to re-assess what roles they can play in cloud services. Some are identifying cloud services enablement as a less complex, more rapid route to cloud revenues.

“We’re finally seeing cloud computing move from hype to mainstream adoption,” says Bernhard Pussel, the director of operator channel at Colt Technology Services. “Recent research into the technology deficit facing European companies found that the use of SaaS and IaaS is set to grow by 55% and 52% respectively amongst European businesses over the next two years, with many enterprises making use of the cloud to complement their own application landscape, and to extend their computing resources in a flexible way.”

Pussel adds that operators, including Colt, are keen to grab a slice of the cloud market, and have introduced their own offerings targeting enterprises. However, it’s expected that mainstream cloud providers such as Amazon Web Services, VMware and Microsoft will still be taking most of the market.

“Recognising the shortcomings of the public internet, more and more

cloud providers such as Amazon Web Services, VMware and Microsoft are tapping into carrier-grade ethernet connectivity and access solutions such as our Dedicated Cloud Access for the delivery of private and hybrid cloud services,” says Pussel.

“Cloud enablement by providing access through ethernet will be a commodity in the cloud space but, given the scale of the market and its geographical spread, it is set to be the biggest cloud revenue generator for operators.”

Business rationale

John Davis, the managing director of BCSG, points out that large operators have several options in terms of how they approach cloud service provision. One approach is to provide the applications themselves, but Davis struggles with the business rationale for that.

“It seems a big bite to create the equivalent of Office365 or a back-up service and then it becomes a question of why an operator would feel the need to do that,” he says.

A second option would be to deal directly with third party providers such as Microsoft, Sage or Cisco to package up an offer of their software for the operator’s customers. Finally, operators could use a company such as BCSG to create an aggregated platform that brings together third party services with a single sign on.

“We work with UK operator EE so it no longer has to keep relationships with 11 different independent software vendors, for example,” explains Davis. “It doesn’t have to create the platform or integrate software vendors into it. It doesn’t have to effect customer support on these applications or hand-off to 11 different support teams because we offer this as part of our service.”

Davis does however, acknowledge that by adding another provider to the value chain, revenue has to be shared out to all the providers. “When there are more parties involved, there are more mouths to feed in terms of sharing revenue,” he says. “The benefits that accrue, though, far outweigh the effort and distraction of trying to do this in another way.”

Consumer facing

Chris Halbard, the executive vice president and international president of Synchronoss, thinks operators are enablers rather than providers. “A provider is consumer facing with premium service levels while an enabler is more about the applications, platforms, tools and APIs to allow services to be generated,” he explains.

Chris Halbard: Creating an effective enablement platform can create added value to offset loss in revenue





Bernhard Pussel: Cloud enablement will be a commodity but it is set to be the biggest cloud revenue generator for operators

John Davis: When there are more parties involved, there are more mouths to feed in terms of sharing revenue



“Enablement is the role of an operator and they have to accept that as a means to bring through innovative services to their subscribers.”

He adds: “The revolution here is for the large operators to accept they have to enable innovation to come through to their subscribers. We are starting to see that a bit. With our major clients a lot of our products are white-labelled cloud services, such as software development kits to bring on more content applications such as music and video.”

James Parton is the director of Europe for Twilio, which partners with operators to make their telecoms capabilities

available in the cloud to app developers and more recently large enterprises.

He sees operators as enablers that will benefit from increased app traffic that they would otherwise not have seen. “Sometimes we’re mistakenly identified as an OTT but we’re the complete opposite,” he explains.

“Historically our customers are those that the operators haven’t been able to address directly but we have the direct relationship with the operator and all the traffic is pushed to their network. Twilio brings the traffic an operator wouldn’t be able to acquire for themselves.”

Davis singles out time to market as one key benefit for an operator that sources a platform from a specialist provider. “With EE were able to deploy within

four months and I’d suggest it would have taken three to four times as long for an operator to build the same capability itself,” he adds. “In addition, the bill for the build would be multiple times greater.”

That’s only exacerbated by long time to market resulting in unearned revenue at best and missed opportunities at worst.

Missing markets

The history of operators has seen lengthy development cause them to miss markets such as music because they took too long to develop attractive, highly resilient services while web-based competitors launched quickly and took the market. In many

cases, by the time operators got to the point of service launch the market had moved on.

“There’s certainly a lack of resources at operators not only to bring apps to market but to do it quickly,” confirms Halbard. “Others brought apps to market fast even if they were only 80% ready rather than waiting six months. By the time you do that, the opportunity is gone. If you have three, six or nine month product life, you can’t have a three, six or nine month introduction cycle.”

Parton, a former Telefónica executive, advocates that operators focus on the value they can already add. “So many tier one operators have invested time and money to try and spin up cloud services but the message is clear: don’t invest that money for little or no return,” he says.

“Instead, find the right partner who already has the capabilities needed. The operator gains not just traffic but also in terms of customer satisfaction through providing the services its customers want.”

He adds: “It’s not a case that there is a lack of skills at operators — operator employees are smart people — but it’s a cultural issue. Operators’ mindsets are defensive and focused on churn reduction and customer retention and, from a CFO perspective the kind of money a successful start-up cloud service will generate is hard to measure in comparison to a one cent cut in termination charges for customers.”

Operators’ relationships with customers are at the heart of their ability to offer that advice. “The value-add from our perspective of an operator as a distribution channel is around trust and the ability of the operator channel to create a simplified apps portfolio,” he adds. “It starts with trust and evolves in a new way. There’s a real convenience in the bundling of apps approach to drive greater retention for operators.”

Few see a realistic prospect of operators competing directly with web giants. “Our objective has never been to compete with the cloud giants but to partner with them,” adds Pussel.

Giants’ offerings

“Trying to compete with these companies would result in failure, in our view. Being a cloud enabler in the cloud access market and complementing the cloud giants’ offerings with our own specialist cloud services will be our recipe for success.”

Halbard concurs. “I’m seeing operators give up on consumer cloud propositions, reckoning that by partnering with an OTT provider they can make some money,” he says. “However, the nature of what is a consumer service is becoming blurred. Office365, for example, can be seen as a soho [small office-home office] service.”

The decision to be a provider or enabler will be made based on what an operator already has and how quickly it can bring new apps to market. “It’s about time and margin,” says Halbard. “It’s about who can react the most quickly to get to that innovation fast whether you have it yourself or not.”

Besides, being an enabler may be no bad thing. “When you create an effective enablement platform, you can create added value to offset loss in revenue from not providing services yourself,” concludes Halbard. ■

Operators have strengths that they can use to compete in the private IaaS and managed hosting markets, writes Andrew Kloeden, but it's more challenging to compete in the public IaaS or SaaS market

Cloud services and data centres: growth opportunities for operators

	Service	Overview	Dedicated or shared infrastructure	Access	Sales channel	Charging model
Public cloud	SaaS	Software applications on shared infrastructure access through internet	Shared	Public Internet	internet (automated)	PAYG
	IaaS (public)	Shared servers/storage accessed through Internet	Shared	Public Internet	internet (automated)	PAYG
Private cloud and hosting	IaaS (public)	Shared servers/storage access through private network	Shared	Private WAN	Sales force	PAYG
	Managed hosting	Dedicated servers/storage managed by DC provider	Dedicated	Private WAN	Sales force	Monthly
	Co-location	Raised-floor space for customer to install own servers/storage	Dedicated	Private WAN	Sales force	Monthly

Key cloud and data centre services and their typical characteristics. This is necessarily a simplification. There are many variants within these broad service classes, and their boundaries are somewhat blurred [Source: Analysys Mason, 2014]

Operators worldwide are looking for new sources of revenue as growth in their traditional businesses has slowed or begun to decline. This is particularly the case in the enterprise telecoms business.

The growth of cloud services and the demand for associated data centre infrastructure could present such opportunities: revenue from infrastructure as a service and software as a service — IaaS and SaaS — alone is expected to double to \$32 billion worldwide by 2017, at a compound annual growth rate of 12%, according to Analysys Mason's latest enterprise cloud services forecast.

Economics and success factors

In order to assess the opportunity, it is important to define the different services in the cloud and data centre value chain because the economics and success factors differ significantly between them. The table sets out a simplified conceptual view of the services at different stages of the value chain, and their typical characteristics.

The simplest service is co-location, which involves the provision of floor space in a data centre for the customer to install its own infrastructure. It is typically sold to large enterprises or to cloud and hosting providers on a wholesale basis.

Managed hosting usually involves the provision of capacity on dedicated servers and storage that are owned by the hosting service provider, and management and maintenance are included.

Infrastructure as a service is similar, except that capacity is shared between different customers in a manner that is invisible to the end customer. It is typically charged on a pay-as-you-go basis, per virtual machine or other unit of capacity. Software as a service involves the provision of hosted applications, which tend to be accessed over the internet.

IaaS may be delivered privately — for example, via an enterprise's corporate WAN — or publicly via the

open internet. SaaS is typically delivered publicly, while managed hosting and co-location are, by their nature, private. This has implications for their economics and success factors. Because public IaaS and SaaS are sold and accessed over the internet, they are often standardised products with automated online sales and provisioning.

Private IaaS and hosting services are more likely to be bespoke, and sold via a dedicated sales force.

Operators have strengths that they can use to compete in the private IaaS and managed hosting markets. Operators already provide WAN services to large enterprises, with which they have strong relationships. They also have large sales forces. As a result, they have an opportunity to bundle IaaS and hosting with their established network services for their large enterprise customers.

Operators can differentiate themselves by offering end-to-end network, IT and physical data centre security and service management — something that pure-play providers may not be able to do. This could be a compelling proposition in security- and compliance-conscious industry verticals, such as pharmaceuticals and financial services.

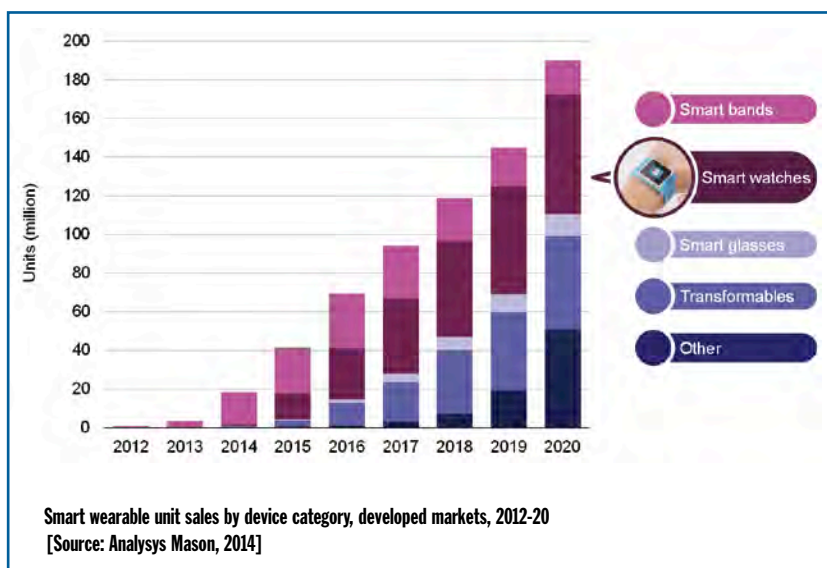
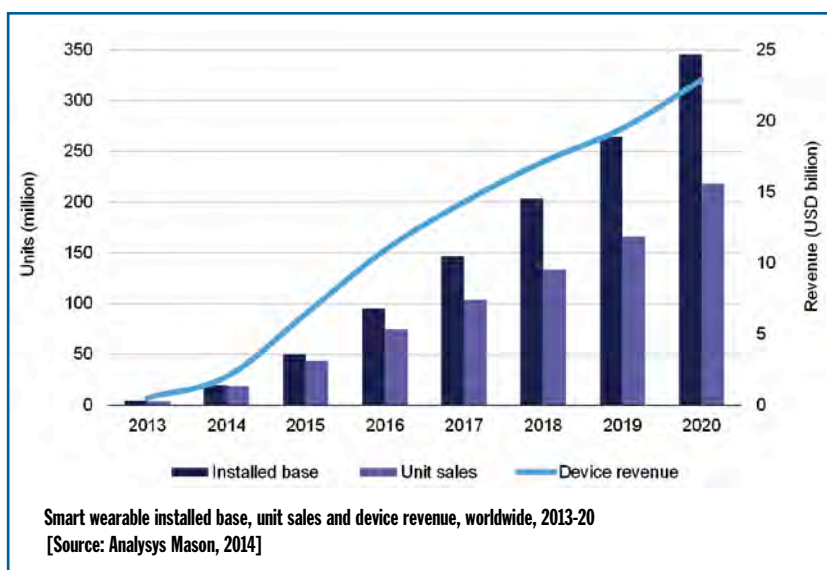
It is more challenging for operators to compete in the public IaaS or SaaS market. This requires significant scale, a fully automated online sales process with near-instantaneous provisioning and flexing of capacity. Neither ownership of the network nor a dedicated sales force is an advantage. This would involve competing directly with companies such as Amazon Web Services, which has massive scale in compute capacity, a fully automated online sales channel and instantaneous provisioning and flexing of capacity.

With well-targeted investments in infrastructure, products, sales and service skills, telecoms operators could be well positioned to capture some of the growth in the cloud and data centre business. ■

Andrew Kloeden specialises in strategy, due diligence and policy advice at Analysys Mason, with a focus on enterprise telecoms, cloud computing and data centre markets. He has worked with telecoms operators, internet companies, investors and governments around the world
www.analysismason.com

As Apple prepares to launch its watch in early 2015, Enrique Velasco-Castillo forecasts an annual 50% growth rate for smart wearable devices

\$22 billion world market for smart wearables by 2020



Sales of smart wearable devices, such as the Apple Watch, will increase by 1,149% between 2014 and 2020, according to Analysys Mason's latest report on the subject. The market will generate \$22.9 billion in revenue by 2020, having grown at a compound annual rate of 50% during the forecast period — see chart.

The smart wearables market will reach an inflection point in 2015, driven by the launch of the Apple Watch. However, sales of competing devices will slow following the announcement of the Apple Watch on 9

“Smart watches will dominate sales of wearable devices by 2017, but take-up is still limited by consumer interest.”

September 2014, as consumers wait for Apple's smart watch to reach stores in the first quarter of 2015.

Fewer than a million smart watches will have sold by the end of 2014, but this number is expected to leap to 13.6 million in 2015, as Apple drives the market.

Other manufacturers — such as LG, Motorola and Samsung — will eventually benefit from the increased interest in smart watches as a credible device type, but we do not expect that any vendor will match Apple's market share in the short or medium term.

The restriction of the Apple Watch to users of the iPhone 5 or later, and planned interoperability with other Apple devices and platforms, such as Apple TV, the HomeKit smart home control, HealthKit and Apple Pay for mobile payments, will strongly reinforce Apple's device and lifestyle ecosystem.

Smart watches will dominate sales of wearable devices by 2017, but take-up is still limited by consumer interest.

Smart bands will account for 90% of smart wearable device sales in developed markets in 2014, but this category will peak in 2016, driven by cannibalisation from smart watches with greater functionality, and new devices that better serve niche use-cases.

The total addressable market for smart watches is limited — in Apple's case, by the active device base of compatible iPhones, but generally by consumer interest. Our forthcoming Connected Consumer survey indicates that only 30% of US consumers would be interested in buying a smart watch, compared with 27% in the UK and 28% in Spain.

Nevertheless, we expect that smart watches will become the dominant wearable smart device in terms of worldwide sales in early 2017, when Apple has cemented its hold on the market. In our forecast, we expect that the smart watch market in developed regions will be worth \$12.9 billion by 2020. ■

Enrique Velasco-Castillo is a key contributor to Analysys Mason's digital economy research, focusing on the opportunities for service providers and vendors in mobile health, payments, commerce, and home automation and security

Service providers should be agile, but this can be achieved only with digitally agile architecture that is catalogue-driven from its core, writes Catherine Michel

The truth behind an agile BSS/OSS



Catherine Michel: Being agile really means being able to create, sell and deliver new services with very little net new IT development or testing

Growing demands of the digital economy, combined with growing customer demands of endless innovation and personalisation, require businesses to remain agile. Customers require instantaneous personalisation of offers accessible via any channel along with the gratification of receiving such offers immediately.

Combine these demands with the delivery of bandwidth-hungry applications supplied to any range of devices and this creates an imminent pressure on businesses to attract and maintain customers' happiness.

The key is simply to give customers exactly what they want, when they want it. Similarly, customers and business both want a communications ecosystem which enables them to interact with their service provider at their own convenience and via any channel they choose.

With operators now investing in next-generation networks, they must develop the flexibility and business agility to stay competitive alongside the long list of over-the-top providers. Retaining customers, increasing ARPU and revenue growth are dependent on businesses' ability to launch innovative services quickly and securely while reducing the time and cost of doing so.

Agility can be defined as the speed at which you can define and execute a capability that is operational, sellable and deliverable to the customer. In terms of operators being agile, it means creating a new product from idea to delivery.

This can be achieved only if the digitally agile architecture is catalogue-driven from its core.

Let's dive into how it works. The end goal of an order-to-install process is to configure and deliver a product to the end customer. This creates a high level of configuration for operators at the order level. The endless selection of product and feature choices, the product bundles and complex pricing policies mean that there are a number of determinant steps required to configure and price the order.

Meanwhile, the technical requirements and business relationships must remain consistent amongst

the items ordered and previously purchased. Thus, there must be both the awareness of the product characteristics selected and the ability to dynamically enforce the rules that the specification of those characteristics trigger so that the order is properly validated before fulfilment.

After the order has been configured and validated for the customer, it then requires decomposition into a level of data that the OSS and the network will understand, thereby kicking off the install stage. Critical to automating the order-to-install process and making it error-resilient is having a common source of reference data — centralised product/service/resource master data management — that can inform the process from the commercial layer down to the technical layer.

The master data management must add contextual rules enforcement capability — configure-price-quote rules execution — that can inform, immediately act upon and validate the selections being made.

The result is a universal, automated implementation across the BSS and OSS. The offer defined within the catalogue matches the offer the customer selected and personalised, which matches the order that was then fulfilled, which matches the type and level of service the customer is then using and, ultimately, what the customer is paying for.

Being agile really means being able to create, sell and deliver new services with very little net new IT development or testing. Looking into what agile BSS and OSS products have in common we uncovered a number of characteristics:

- **Best of breed:** Each application is best-in-class in and of itself. All capabilities are designed to be catalogue-driven.
- **Modularity:** It is not an all-or-nothing or rip-and-replace paradigm. We expect customers to utilise significant portions of their BSS/OSS, while incrementally modernising critical systems in the idea-to-install path. Applications can be implemented singularly or as pre-integrated components, depending on the core needs of the customer.
- **Interoperability:** Interface architecture should be standards based, with common integration protocols. Each application should be designed for open interoperability — inbound and outbound — within a diverse/heterogeneous application landscape.
- **Cloud and mobility:** Applications should be deployable in the cloud or on-premise. User interfaces should be multi-device compatible, using the latest front-end technologies.

Operators now have the tools to evolve into the quick and agile business that the digital market demands. They can react speedily and securely to fast moving markets and customer demands and can adopt agile capability incrementally, without the disruption and cost of replacing legacy immediately. ■

Bringing you the leaders of the industry... ...issue by issue

Here are just a few of our latest interviews, still available for you to read on our website. To read the interviews, go to www.globaltelecomsbusiness.com and select the 'Interviews' link at the top of the screen, or type the tinyurl.com code directly into your browser



Vittorio Colao,
CEO of Vodafone

<http://tinyurl.com/GTB-Colao>



Randall Stephenson,
chairman and CEO of AT&T

<http://tinyurl.com/GTB-Stephenson>



Dan Mead,
CEO of Verizon Wireless

<http://tinyurl.com/GTB-Mead>



Stéphane Richard,
CEO of Orange

<http://tinyurl.com/GTB-Richard>



Anne Bouverot,
director general of the GSMA

<http://tinyurl.com/GTB-Bouverot>

These are just five of the 150 interviews that Global Telecoms Business has carried out with industry leaders in the past few years. All of these are still

available via our website and on our free iPad edition. To download the iPad edition, go to <http://tinyurl.com/GTB-iPad>

Telecoms operators worldwide are developing their cloud offerings to small, medium and large enterprises, sometimes in partnership with Google's cloud service

Telecoms operators boost their cloud offers to enterprises and government organisations

Level 3, Tata Communications and IX Reach have all announced deals to connect their cloud solutions to the Google Cloud Platform, which is designed to allow developers and enterprises to build, test and deploy applications.

Each of them has linked up their own cloud solution to Google's. Level 3, for example, has connected its Level 3 Cloud Connect Solutions ecosystem. Tata has become a Google Cloud Platform authorized services partner by connecting with its IZO Public, a cloud platform. IX Reach said that it can now connect its global high-speed network directly to Google and provide enterprise-grade connectivity to the Google Cloud Platform.

Steve Wilcox, founder and technical director of IX Reach, commented: "Google Cloud Platform is a fantastic tool for content and application developers and a valuable tool for many businesses around the world. We're extremely pleased to be a part of the movement into cloud computing and being able to connect our customers with dedicated, private bandwidth from locations convenient for them."

Anthony Christie, chief marketing officer at Level 3, said: "The network is a critical link in enabling cloud computing, and the combination of Google Cloud Platform and Level 3 reinforces our commitment to offering our customers more choice and flexibility when it comes to making the important decisions around their cloud needs."

Julie Woods-Moss, CEO of Tata Communications next-gen business division, said: "Together with Google, we are committed in creating an ecosystem

to make the internet fit for business to address how businesses use the internet to connect to the cloud in a secure and predictable way."

Level 3's offer provides "secure local connections from enterprises to leading cloud service providers like Google Cloud Platform globally, while supporting all of their public and private networking needs regardless of the network architecture or bandwidth required," said Christie.

Tata Communications said it will be collaborating with Google to provide businesses with a simple and future-proof way to connect and build their cloud over the public internet — "providing unparalleled performance, reach and capacity ensuring a consistently good user experience for enterprise end-customers".

IX Reach said it could provide enterprise-grade connectivity to the Google Cloud Platform. "Enterprises are now able to connect their on-premises network, data centre or any other network resource to Google via IX Reach."

It's not just with Google that operators are moving heavily into cloud services. Service providers are starting to offer services to governments and other public services as the acceptability of cloud increases.

Telstra, for example is due to launch its Government Cloud service in Australia in early 2015. "The new environment will significantly increase the ability of government organisations to access highly secure and compliant cloud services and help achieve their cloud first policy objectives across both unclassified and protected level data," said Telstra.

Erez Yarkoni, the executive director of cloud at Telstra Global Enterprise and Services, said: "Telstra has a long and successful history working with governments and we're committed to ensuring our relationship continues to grow as technology requirements change and evolve.

"As governments move into a new era of service delivery transformation to meet the current and future digital expectations of its citizens, the ability to use protected cloud services is as critical to their future plans as it is to the private sector — digital disruption is impacting everyone."

He said that "Telstra's Government Cloud will provide confidence that the data is safe and hosted in Australia".

The service "will also help enable the public sector to achieve greater efficiency and generate more value from its ICT investments," added Yarkoni. "In line with our own cloud strategy to offer increased flexibility and choice, this new, highly secure cloud platform will help enable governments to be leaders

Anthony Christie, Level 3: The network is a critical link in enabling cloud computing



Julie Woods-Moss, Tata
Communications: an ecosystem to
make the internet fit for business



in the use of cloud services and provide opportunities for continued innovation and collaboration.”

In the Middle East, Mobily — owned by the Etisalat group — said that it is now providing cloud services to more than 35 government and private sector agencies in the country.

Mobily is working with companies such as IBM and Virtustream, the company added, and it provides cloud computing services powered by Intel cloud technology in the Middle East and Turkey.

Mobily admitted that there are worries about threats to “many companies and strategic sites around the world”, and said it “is working to fulfil the vision of the government regarding the necessity to rely on cloud computing services provided by national companies”.

It says it has “dispelled the fears and worries of several governmental agencies and business enterprises about relying on cloud computing services” such as information security and control of IT infrastructure.

All information is stored and managed within Saudi Arabia, said the company, and the company has designed its cloud services “with high security specifications [and] flexible control in performance”. This

Eelco Blok: Our clients are turning to
cloud to improve speed and agility of
their business



“provides significant advantages in the traditional infrastructure of governmental agencies and companies”.

Level 3 said that its cloud solutions allow customers to move private and public workloads to Google Cloud Platform with greater reliability. Its system provides access to the platform in North America, Europe, Latin America and Asia.

Other operators that have announced strong expansionist moves into cloud services include Singapore’s M1, Telecom Italia Sparkle and KPN in the Netherlands.

TI Sparkle, the services arm of Telecom Italia, has launched a global service, YourCloudStore, as a white-labelled cloud service aimed at telecoms operators, internet service providers and other channel partners.

Elisabetta Ripa, the CEO of TI Sparkle, said that YourCloudStore “adds new value to our existing cloud services portfolio as we now reach a global scale”. She added: “At the same time we offer our existing and future customer base the opportunity to easily expand their portfolio with IaaS and SaaS solutions and quickly generate new revenue streams with minimal investment and the lowest risk.”

KPN said it is partnering with IBM to offer value-added cloud services. KPN’s CEO, Eelco Blok, said: “Our clients are turning to cloud to improve speed and agility of their business, which are critical factors for success.”

The Netherlands incumbent said it will build its value-add cloud services on top of IBM’s flexible cloud infrastructure to provide its clients with privacy, security, and control. Added Blok: “We were looking for a strong cloud partner that could offer our clients an easy accessible, flexible and secure cloud platform.”

KPN will also offer a choice between three infrastructure-as-a-service delivery models: bare metal servers, single-tenant virtual machines and multi-tenant virtual machines. For each workload, KPN said it “can configure and order a solution with physical or virtual servers that can deliver the required strong performance, security, scalability and manageability”.

M1 has built its own next-generation data centre in Singapore from which to run enterprise cloud offerings, the company announced.

Willis Sim, the company’s director of product development and enterprise services, explained: “The data centre offers SMEs the opportunity to outsource resource-intensive data centre operations cost-effectively to a trusted party, so they can focus on growing their business.”

In addition to its new data centre, M1 has announced strategic partnerships with technology vendors to enhance its cloud offerings. It is working with Hitachi Data Systems to offer customers cloud-based infrastructure-as-a-service, computing-as-a-service, storage-as-a-service and productivity-as-a-service.

It has also partnered with Alcatel-Lucent, Aruba, E-Cop, Ransnet and Samsung to deliver new cloud-based applications including unified communications, managed wired and wireless network security, and digital signage applications.

“These services will enable SMEs to tap on the power of the cloud to scale their IT needs as their business grows, flexibly and quickly,” said Sim. ■

I wouldn't start from here if I were you, writes Alan Burkitt-Gray about the challenge of restructuring Europe's mobile operators into three or four powerful pan-European players

The great European consolidation may be about to start, or perhaps it is all just too complicated

There's been a consistent theme that many of Europe's telecoms CEOs have repeated over the past couple of years in interviews with Global Telecoms Business. Whether it's Stéphane Richard, CEO of Orange, speaking to GTB in early 2013, or Vittorio Colao, CEO of Vodafone, or a number of other industry leaders, the message has been the same.

In the US, Japan and China there are three or four significant mobile operators in each market. In Europe there are dozens of operators — and that puts Europe at a disadvantage in terms of scale to the world's other leading economies.

There is no European equivalent of a Verizon, or a China Mobile, or an NTT DoCoMo that can build networks to serve hundreds of millions of people and benefit from lower prices from the equipment vendors, the billing companies and the handset makers. As a result, they say, capital investment in Europe lags behind other developed regions of the world.

So how could Europe's mobile industry get to a point at which it is comparable to that of the US or Japan — with four major operators each — or China, with three?

It's hard at this point not to repeat the old story of the driver who's lost his way down a country road, and stops to ask for directions from a farmer leaning on a gate. "Well, I wouldn't start from here if I were you," says the farmer.



KPN of the Netherlands has sold its E-Plus German mobile business to Telefónica

That's exactly how it is with the European mobile market. From the early 1980s each country's own government licensed 2G and then 3G and 4G operators independently of any plan to create pan-European companies.

It was a major achievement that — thanks to the EU's hard work 30 years ago — a standard approach was taken to technology: the EU-backed GSM system was adopted, with the ability to roam, and Europe has kept in the GSM family ever since and, thanks to Europe's market size, the GSM family has become a global standard.

Structural mess

But Europe is still left with the structural mess that dates back over those three decades.

However, consolidation is in the air. In recent times Hutchison, which owns Three, has bought Orange Austria as well as Telefónica's O2 Ireland; Telefónica has bought KPN's E-Plus in Germany; and BT is talking to two UK operators about a deal.

The mergers and acquisitions specialists in banks and law firms face the prospect of business over the next few years as Europe's operators come together.

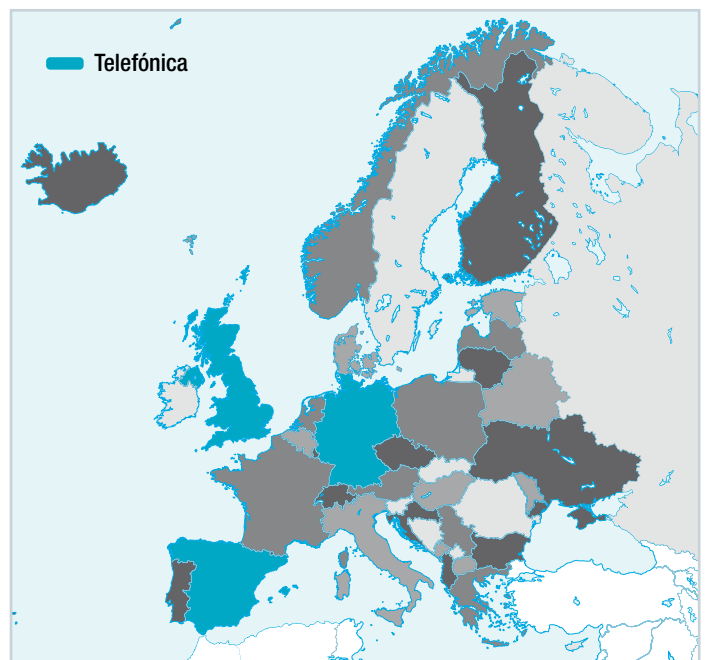
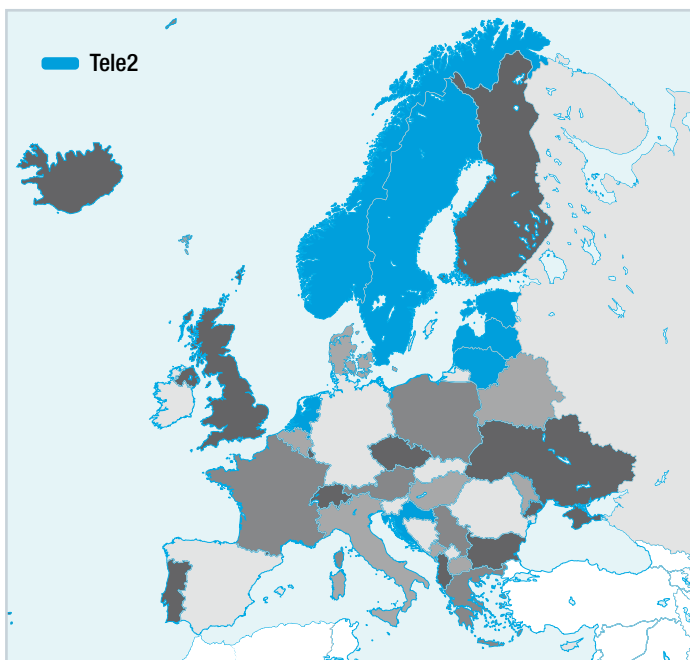
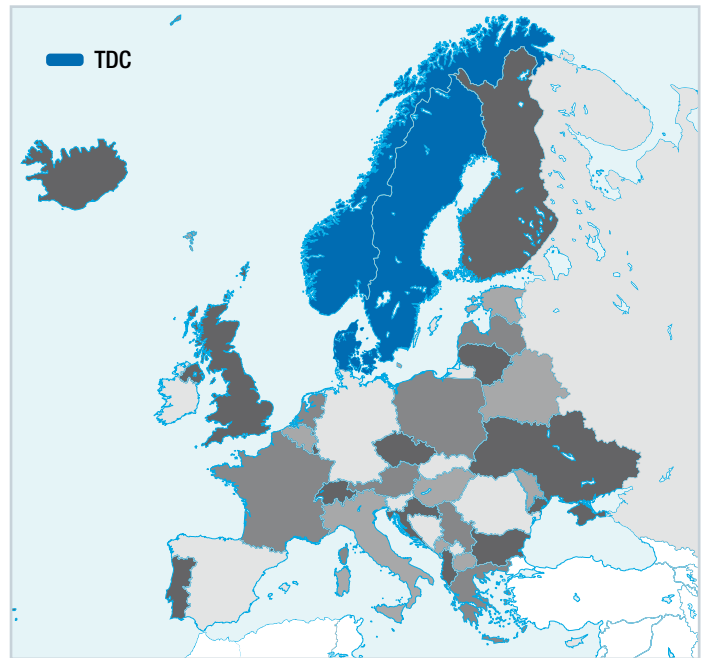
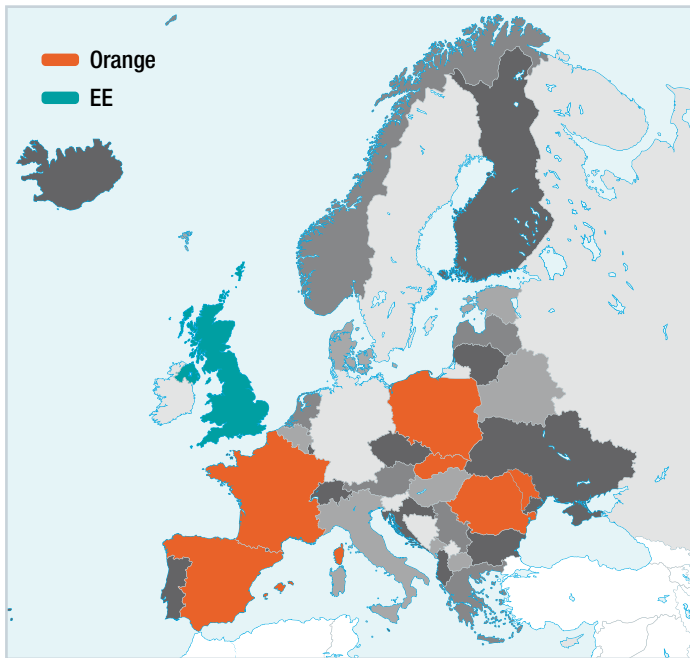
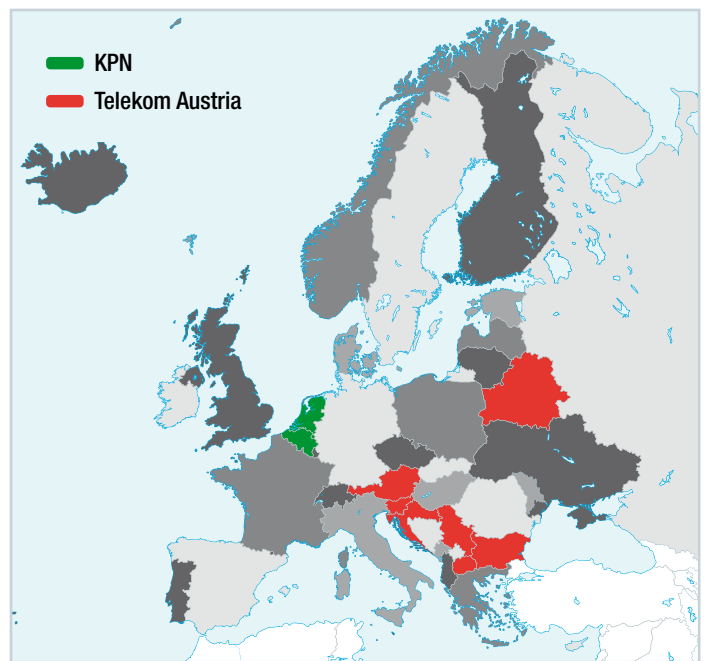
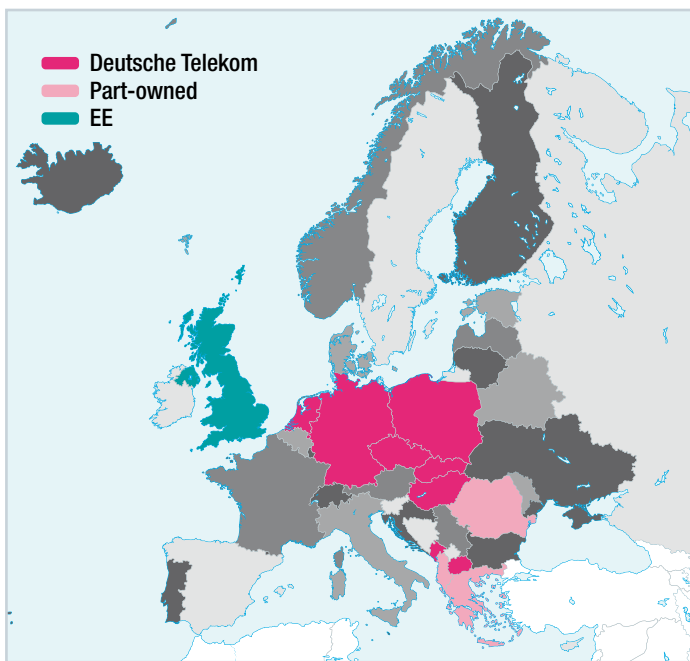
Or will they? Is there an M&A scenario that could move the European mobile business to a situation that is remotely comparable with China, Japan and the US? Our maps suggest the chances are remote.

First, let's analyse the market diversity as it is today. This is an ever-changing position — though, thanks to the slowness of national and European competition and telecoms regulators, changes never happen very quickly. In two of Europe's smaller countries, it took Hutchison 11 months to acquire Orange Austria and 13 months to complete its purchase of O2 Ireland. A sense of urgency doesn't come into it.

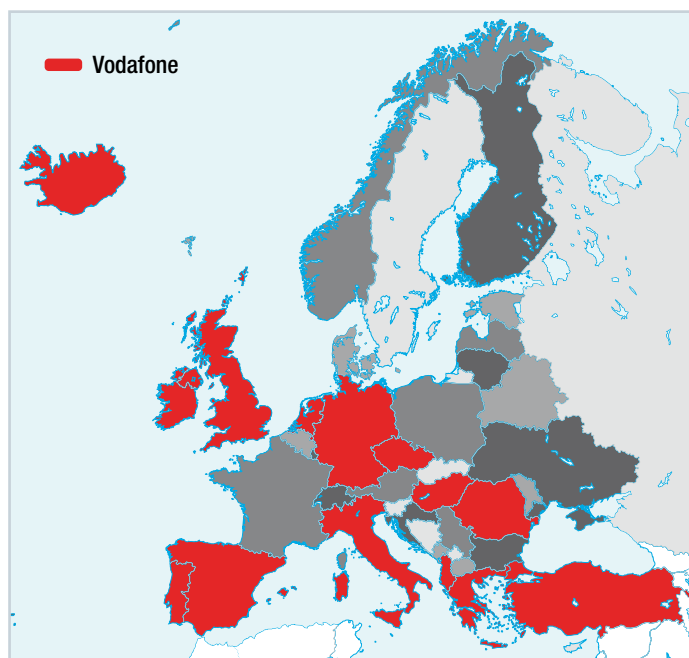
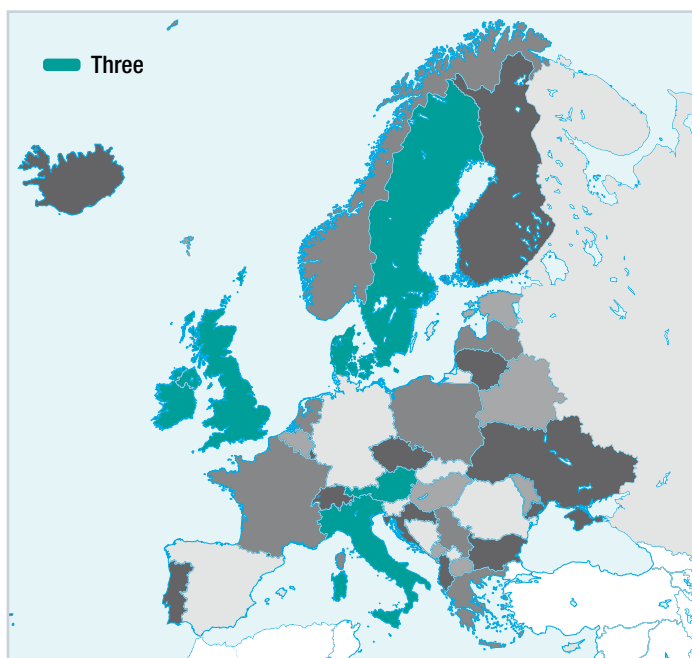
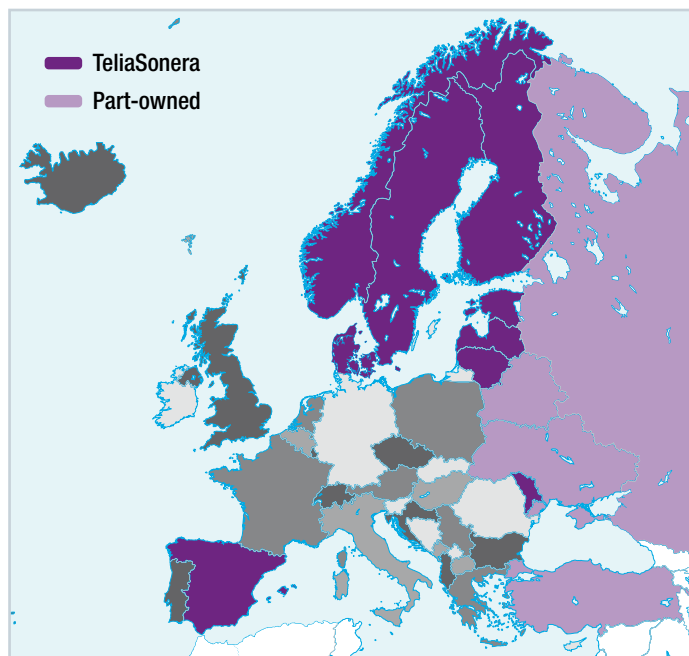
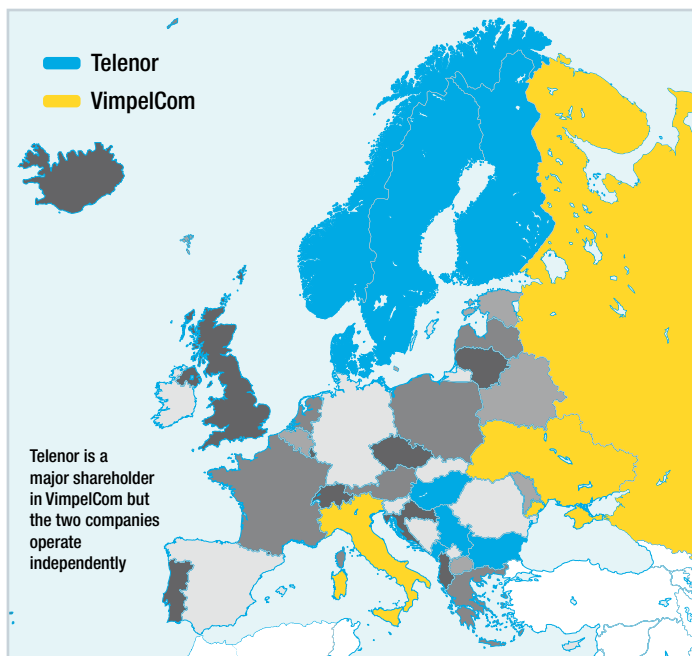
The European Union has 28 member countries. How many mobile operators are there? The best source of information is the GSM Association's online roaming guide. Run through the member states, country by country, and add up the number of active operators: the total is 96.

But that's not all of Europe. But there are another 24 European territories and countries that are not in the EU. Many of them are statelets, such as Andorra, the Faroe Islands, the Isle of Man, Monaco and San Marino, but some of them are significant nations in terms of economy and population: Norway, Russia, Switzerland and Turkey, for example, as well as Georgia, Iceland, Serbia and Ukraine.

There appear to be 67 operators in the Europe that's outside the EU. This means that in all of



European consolidation



Europe — taking a definition of Europe to include everything west of the Caspian Sea — there are 163 operators.

Some operate across a number of countries, though in almost all cases each national unit is a separately managed entity. Our maps illustrate some of the bigger transnational operators, companies such as Orange and Deutsche Telekom, Tele2 and Telefónica, Vodafone and TDC.

The maps also show operators' part-owned companies — TeliaSonera's interests in Russia and Turkey, for example, and Telenor's shareholding in VimpelCom. América Móvil's two European interests, Telekom Austria and the shrunken KPN, feature on one map, though the two groups remain completely independent.

The UK operator EE shows up on two maps, that showing Orange and that showing Deutsche Telekom: each owns 50% of EE.

Business partnerships

The maps don't show Vodafone's business partnerships with SFR of France, MTS of Russia or Telekom Austria, for example, on the principle that if a merger or takeover were being proposed, such deals could be unravelled.

But it's tempting to look at where the European industry could get to if it did start on the consolidation road from here — and where it couldn't.

The maps show that many groups have conflicts of interests that would impede a merger. Orange and TeliaSonera couldn't merge without something happening to one of their Spanish interests.

TDC, majority owned by Providence Equity Partners, Apax Partners, Blackstone and Permira, has a business entirely confined to Denmark, Norway and Sweden. It could be acquired without conflict by one of a number of larger operators, including Deutsche Telekom and Orange, and even — though this seems unlikely at the moment — Telefónica.

TDC would also make a good fit if América Móvil's owner, Carlos Slim, were looking for acquisitions to add to his existing European shareholdings.

But of course, this is assuming that CEOs, CFOs and shareholders of major European mobile operators are looking to mesh existing groups.

Telefónica admitted in November that it is talking to BT about selling O2 UK, a move that would leave O2 Germany in Spanish hands. It has already sold off O2 in the Czech Republic, Slovakia and Ireland, potentially reducing — if a BT deal is done — Telefónica to ▶



Telefónica has sold its O2 Ireland business to Hutchison, which owns Three Ireland

just two countries in Europe. That would make Telefónica a possible conflict-free M&A partner of TDC, Telenor or Tele2 — or even Hutchison’s Three.

Telecoms jigsaw

But, for all the fun that could be had with this telecoms jigsaw — a Christmas season board-game, anyone? — this doesn’t bring the European industry to anything like the Chinese, Japanese or US market, with three or four players across the whole market.

Could that be done? With the patchy geographical spread of most operators, it’s difficult.

Perhaps it could be achieved by naming three or four European champions and pressing other



BT may acquire O2 UK from Telefónica or EE from Orange and Deutsche Telekom

EUROPEAN UNION MEMBER STATES AND MOBILE OPERATORS	
Austria	3
Belgium	3
Bulgaria	3
Croatia	3
Cyprus	2
Czech Republic	3
Denmark	4
Estonia	3
Finland	4
France	4
Germany	3
Greece	3
Hungary	3
Ireland	3
Italy	4
Latvia	3
Lithuania	3
Luxembourg	4
Malta	3
Netherlands	3
Poland	4
Portugal	3
Romania	5
Slovakia	3
Slovenia	4
Spain	4
Sweden	4
UK	4

NON-EU EUROPEAN COUNTRIES AND MOBILE OPERATORS	
Albania	4
Andorra	1
Armenia	3
Belarus	3
Bosnia Herzegovina	3
Faroe Islands	2
Georgia	3
Gibraltar	2
Guernsey	2
Iceland	4
Isle of Man	2
Jersey	4
Liechtenstein	3
Macedonia	3
Moldova	3
Monaco	1
Montenegro	3
Norway	3
Russia	6*
San Marino	1
Serbia	3
Switzerland	3
Turkey	3
Ukraine	4
* includes regional operators	
Source: GSMA	

operators to do deals with them so that they would each be pan-European.

Which operators? A European restructuring would have to start with the major economies of the EU — which means Germany, France and the UK plus Italy and Spain. That makes Orange, Deutsche Telekom, Telefónica and Vodafone the obvious candidates, all with businesses in at least one, ideally two, of the large European markets and with a number of subsidiaries in smaller countries.

But there would be screaming and shouting if anyone suggested that each of the operators in Denmark, Latvia, Italy, the Netherlands and all the other EU member states had to be merged with one of those big four.

Could Telecom Italia or France’s Free, or Portugal Telecom, or Eircom in Ireland, or KPN in the Netherlands be firmly shoved towards the jaws of one or other of the big four in the interests of creating a small number of giant champions across the EU? It seems unlikely that local shareholders, governments and regulators would agree to such coercion.

At that point the farmer’s comment — “I wouldn’t start from here if I were you.” — sounds completely sane. ■

TSF helping to combat violence against women and migrants in central America

Télécoms sans Frontières has extended its activities in Central America to help people at high risk of violence, kidnappings, gang crimes and in some cases, murder.

TSF has been in Nicaragua since 2003, supporting and protecting people using mobile technology, but now the organisation is helping to combat domestic violence and is helping vulnerable migrants.

In the Nicaraguan region of Chinandega, almost 60% of women have been victims of domestic abuse, figures that led TSF to work with a local women's movement, Movimiento de Mujeres de Chinandega, to help the thousands of victims.

TSF developed a text system to allow victims to send simple SOS alerts to a central system which then sends an alert out to a network of 17 social workers throughout the region. TSF had given them all mobile phones and they can intervene case by case.

In 2014, project developers from TSF's Nicaraguan base took the project to the next level by creating a system to register each case on a map. This permits a more efficient service and lets the social workers spot early warning signals in the each community.

TSF has set itself the following objectives:

- to provide protection and comprehensive speciality care for victims of violence, especially sexual violence;
- to strengthen inter-agency coordination, networks of local social workers and women's organisations to ensure the resolution of complaints of violence against women and the identification of early warning signals.

Télécoms sans Frontières is using its technological skills to combat domestic violence Nicaragua and it is helping vulnerable migrants

Organised crime, violence and kidnapping are just a few of the many issues facing migrants in the area. Since its foundation, TSF has been dedicated to re-establishing lifelines for those who find themselves in vulnerable and precarious situations.

TSF teamed up with a local organisation in Guadalajara, FM4 Paso Libre, whose mission is to promote dignity and justice for society's helpless populations, regardless of their origin, ethnicity, gender or religion.

The Lazos Libres — Free Links — project started in 2012 at the FM4 Paso Libre centre where, in its first year alone, over 5,000 migrants were welcomed and provided with vital humanitarian aid including meals, access to sanitation facilities, rest, psychological and legal assistance, awareness workshops, as well as free international communication thanks to TSF's communications cubicle.

An average of 200 of the most exposed migrants are able to re-establish contact with their families each month and report on their situation, increasing their emotional strength.

In 2014, the success of this programme led to the expansion of the project into what is now known as Conectando Vidas — Connecting Lives. This aims to facilitate and streamline access to humanitarian communication. It provides maps showing embassies, government agencies and humanitarian aid.

This new and improved programme will also allow beneficiaries to be registered onto an online database

shared among several organisations. The database enables fast tracking of people in the case of accident or disappearance, information that is then registered on the information maps. In many cases, this helps to reunite families lost in transit.

As one 29-year-old migrant said: "My family was worried about me. I hadn't been able to call them and they thought something happened to me, and when the family is worried the road gets even tougher. The road is full of perils and both sides are in need to comfort each other."

In all of its projects, TSF is constantly searching for ways in which to improve and adapt new technologies and telecommunications services to needs of the hundreds and thousands of vulnerable people across the globe and their ever-evolving humanitarian requirements. ■



Migrant at the FM4 Paso Libre centre uses TSF's technology to call home

Global Telecoms Business will be supporting Télécoms Sans Frontières by publishing regular reports about its activities. TSF continues its valuable work through contributions from the telecommunications industry. For more information and to learn about ways to support the charity, see www.tsfi.org



Supporters of Télécoms Sans Frontières throughout the industry can now donate online using PayPal to help its work around the world.

A donation of \$10 offers a three-minute hope for three refugee families or disaster victims anywhere in the world or supports the transmission of a two megabyte file of priority health care needed by humanitarian workers in a crisis. A donation of \$1,500 finances the connection of a Telecom Community Centre in remote areas for three months.

US supporters can donate in dollars, tax free. UK supporters can increase the value of their donation in pounds through Gift Aid. Those making euro payments will receive a donation certificate which may be used for tax deductions. For details go to tsfi.org/en/donate-on-line

Global Telecoms Business for the industry's CFOs

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TELECOMS
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**50 CFOs TO WATCH
2015**

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CFO SUMMIT 2015

Who will be the CFOs in the hot financial seats in our industry next year?

We on Global Telecoms Business have been publishing an annual guide to the 50 CFOs to watch for the past few years.

We're now looking for the 50 CFOs of telecoms service providers to watch for 2015. We want your help in identifying them.

Publication

Online in February 2015 and in the printed January-February 2015 issue

Deadline for nominations

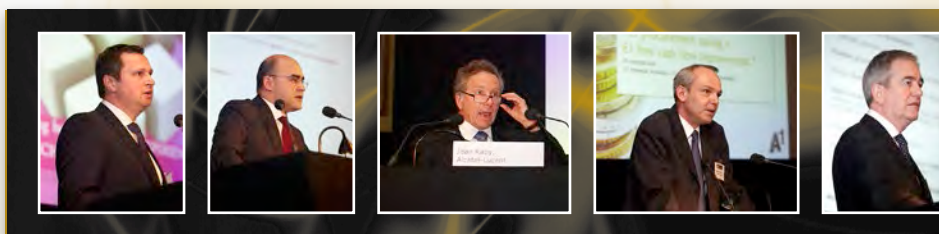
Monday 1 December 2014

How to nominate

Send an email to the editor, Alan Burkitt-Gray, at aburkitt@euromoneyplc.com. To help us track and follow up nominations please start the email subject line with 'CFO to watch' and the person's name



GTB CFO Summit



CFOs are telling us that they, and the telecoms industry, are facing a new set of challenges

- What sustainable revenue streams can operators continue to rely on and what new revenues can they develop?
- What costs can operators continue to take out from their networks to become still more competitive?
- What are the sources of finance for building the fast fixed and mobile broadband networks that we need?
- How can operators continue to be an attractive proposition for shareholders, banks, private equity and other investors?

The next GTB CFO Summit will bring together carrier CFOs to explore the

issues they have raised and look for answers. Delegates attending the Summit will be able to gain a great deal of important market intelligence from the speakers and the panels. The GTB CFO Summit offers excellent networking opportunities because there will be a major concentration of CFOs in one place.

This will be the third annual GTB CFO summit and we're already booking speakers — industry leaders such as Joe Euteneuer, the CFO of Sprint, is one of the first to agree to take part.

The event will be in London on **Tuesday 24-Wednesday 25 March 2015**. We'll be announcing the full exciting agenda and details of the venue later this year — but put the dates in your diary now!



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