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Fibre to the Home Council Middle East & North Africa

FTTH: The nervous system

The keys to **successful smart cities** development

The 9 Dimensions of an **NBN Policy**

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Fibre to the Home Council Middle East & North Africa

FTTH: The Nervous System

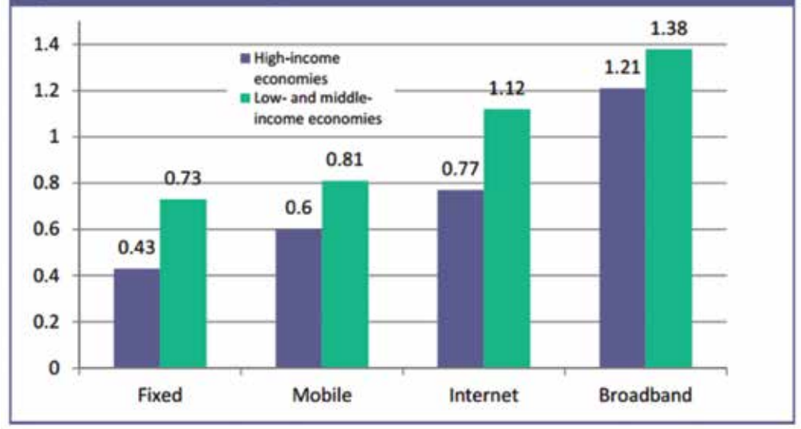
Dr. Suleiman Al-Hedaithy, the chairman of FTTH Council MENA, is a man tasked with an incredible mission. The Council has to maintain its position to continuously promote fiber to the home as the only future-proof technology, and to collaborate with governments and policy makers to accelerate the deployment of FTTH on national levels across a particularly unstable yet promising region.

Dr. Al-Hedaithy believes that FTTH is precisely the answer to deliver on that promise for sustainable prosperity across the region: "We are actively seeking to support the deployment of future proof, fiber to the home networks that will support economic growth in countries as well as enable important services such as e-Health, e-Government, e-Education, etc. to be adopted." This vision for an infrastructure that carries the transition to fully-functional knowledge economies across the Arab world is not built on assumptions.

He says: "We believe there is a weight of evidence supporting the economic benefits of deploying high speed broadband. World Bank figures show irrefutably how economic growth follows higher penetration of telecommunications in any given society. This effect is greatest when it comes to broadband."

Citing similar studies and statistical evidence, Dr. Al-Hedaithy expands on his idea. He concludes that in terms of broadband, the more the better. "There are other interesting examples which discuss the impact of upgrading speeds. In the US, one study suggested that every dollar spent on delivering services at 50meg/s or faster would generate three times the investment in extra GDP in the following five years. Recent studies have also linked superfast broadband availability and the economic benefits to a country. This is just some of the research into the economic effect of generalized broadband."

Figure 3.1 How investing in broadband can boost economies



The vertical axis represents the percentage increase in economic growth per 10% increase in telecommunication penetration

World Bank (2009)

While the region still hasn't reached the level of markets like Finland, Hong Kong or Japan, the trend is definitely taking over, especially in the GCC. Dr. Al-Hedaithy's assessment of the main Arab markets illustrates the phenomenon.

"The Kingdom of Saudi Arabia is a maturing market but still holds plenty of headroom for deployment of ultra-fast broadband services. The UAE has the highest FTTH penetration of households in the world but there also remains headroom in the market and most of all, the potential for the addition of significant new services to further enhance the lives of those in the Emirates. Qatar will have an incredible FTTH infrastructure and this will help them attract further investors into the country."

For the wider region, progress might have to take its time. In North Africa, things haven't gotten to that stage yet. "North Africa will continue to be patchy depending on the location but we expect to see significant projects there soon," says Dr. Al-Hedaithy.

He also points out, "Recent conflicts in the Arab World have definitely had a negative impact on national programs and FTTH infrastructures. Telecom infrastructure projects and national programs in many of the countries in question were delayed and in some cases existing infrastructures were damaged. However, we expect that most of the subjected countries will accelerate telecom infrastructure development once their political situations are stabilized."

National programs remain nevertheless the way to go about FTTH according to him. "A national FTTH plan offers the best chance for governments to provide the right support and incentives but we are also prescriptive for any other local plan that works well, we would fully support it."

Other challenges still exist across the board, regardless of penetration levels in individual territories. Those are being continuously tackled by FTTH Council MENA. Lack of local engineering talent to support FTTH generalization seems to be chronic in the region, an issue the Council focuses on, according to the chairman.

"We support education and training for engineers and would love to see more home grown talent available to support these programs starting from strategic decision making to technical and deployment training. Under our education section within our technology and training committee, we provide the know-how through regular training programs on the technical aspects of fiber deployment and workshops about the strategy and business case of fiber. We also conduct a yearly study and various research initiatives in order to help increasing awareness. We provide information on our website that supports our annual conference. That event showcases best practices and helps spread greater awareness. We also coordinate with our sister councils within the FTTH Councils Global Alliance platform to strengthen our regional and global presence and to adapt our activities in respective markets."

The emergence of LTE in the Middle East also poses a question to the FTTH community, especially when it

comes to the awareness of various stakeholders to keep investing in fiber; but missing out on FTTH is simply not a viable option.

Dr. Al-Hedaithy insists, "You don't just go through FTTH, it is the ultimate solution in terms of capabilities, far beyond LTE. LTE has an important role in some countries to provide services, but when you are sharing a base station, it is hard to achieve the advertised speeds at peak hours. We all have experienced mobile data under-delivering on the fantastic speeds being promised. Compare this to FTTH that already delivers 1 Gbps symmetric (up to 2 Gbps in Hong Kong). LTE remains a solution for less dense areas, or as a complementary service. We want fiber in the office and at home and LTE on the go."

Dr. Al-Hedaithy envisions a more harmonious telecommunications ecosystem instead. Not only does he believes that generalized FTTH is irreplaceable, he actually believes that it is essential for smooth operations in mobile networks.

"With the increasing demand of bandwidth and the rapidly accelerating consumption of mobile data driven by 3G, 4G and the future 5G, it is very important to mention that operators will face many challenges to meet this expected level of demand and will have to implement the fiber solution to provide mobile backhaul. Operators looking to deploy the next wireless generation technologies will have to deploy fiber at the same time to relieve their backhaul bottleneck, ensure a successful launch of their services, and avoid network failure. Fiber is definitely the way to tackle the backhaul issue with its ability to provide unlimited data, whilst other options simply don't have this capacity. We also collaborate with the operators of the region to create the awareness about the necessity of fiber deployment in the mobile backhaul."

Dr. Suleiman Al-Hedaithy

Dr. Suleiman Al Hedaithy is the Chairman and board member of the FTTH Council, for the Middle East & North Africa.

Since 2006, Dr. Al-Hedaithy is also the president of Middle East Fiber Cable Manufacturing Co. (MEFC),the largest producer of optical fiber cables and related products in the region.

Prior to joining MEFC, Dr. Al Hedaithy worked for the Ministry of Defense and Aviation in Saudi Arabia for more than 20 years.

He actively participated in the development of the National Science & Technology Plan and the National Information Technology. He holds a Doctorate of Science and a Masters degree in information systems management from George Washington University, USA. He also holds a B.Sc degree in business statistics from the University of Tennessee, USA.

Only then, both technologies will be able to deliver on their initial promises: giving access to the best of both worlds. Dr. Al-Hedaithy explains, "The perfect mix is FTTH to every home and LTE on the go. The practical mix will change from country to country, but when people experience fiber and services such as streaming and VOD delivered over it, mobile is not even close to being a competitor in terms of capability. Moreover, the GDP benefits of fiber everywhere are significant and FTTH to all homes in Europe could payback in GDP increases in just over two years say. Sadly, getting the governments to agree is difficult and they don't see the benefits directly as tax… they go to the happy citizens. Governments wanting to compete for investment etc. are increasingly seeing the value of national broadband network (NBN) programs to back up their economies. And here comes our role as council to support governments and leading them to the best approach for NBN policies."

With smart city and smart government initiatives flourishing around the region, acceleration of FTTH programs will be in order.

Dr. Suleiman Al-Hedaithy asserts, "This type of initiative cannot work well without FTTH/B. A smart communications infrastructure acts as a nervous system for a smart city or development, and fiber is the only solution to deal with the speeds, volumes, reliability and growth that will result from the internet of things. If a smart city needs to rely on something to work well, fiber is the best solution."

Preparing for that, FTTH Council MENA is doubling down on training programs and workshops to support operators, network owners, smart cities, vendors and other stakeholders across the region with the set goal of sharing global benchmarks for best practices. TR

The keys to successful smart cities development

Smart cities, big data, machine to machine, internet of things. These are the big interconnected trends in our industry. Let's think about why we're talking about smart cities.

In the future, the percentage of the population living in cities will continue to increase – growing by 700 million in ten years according to the UN.

The pressure on funding, services, transport infrastructure, energy, etc. will also increase and it takes a coordinated approach to these limited resources to hope to deliver an optimum solution.

The Smart Cities Committee of the FTTH Council MENA has been working to share some of the global learnings and also to contribute to key documents like the Smart Cities Council Readiness Guide. "We need to go deeper into the thinking behind the telecoms infrastructure of a smart city to understand how it can really add value and how it will address smart developments. This means thinking about super-buildings like the Burj Khalifa (that are effectively vertical cities in the sky), through to smaller but modern developments. We believe telecom infrastructure is a key factor in the success of the smart cities development in the MENA region," says Richard Jones, Smart Cities Committee Chair of the FTTH Council MENA.

So what's a smart city and how does it work?

Smart cities use "everyware" – a term meaning pervasive and ubiquitous computing and digitally instrumented devices built into the very fabric of urban environments (e.g., fixed and wireless telecoms networks, digitally controlled utility services and transport infrastructure, sensor and camera networks, building management systems and so on) (Greenfield 2006).

The everyware… "improves the performance and delivery of public services while supporting access and participation" (Allwinkle and Cruickshank).

But smart cities are only smart because they have a telecoms nervous system that centralizes inputs to use power more efficiently, smooths the use of critical resources at moments of peak load, help traffic run more smoothly, improve public security, etc.

So that nervous system needs a few characteristics.

You want it to be:

- *Reliable:* You can't afford to have safety critical systems failing.
- *Fast:* You want the ability to respond to changes quickly.
- *Predictable:* If not, you can't control anything with certainty.
- *Future Proof:* Volumes of sensors and Internet connected devices will grow exponentially – so the network will need to cope with rapidly if increasing data volumes.

The network will also need to support the needs of WiFi and mobile networks as expectations should be of exceptional coverage.

Compared to the overall cost of real estate construction; telecoms, entertainment and smart city systems need relatively little investment. However, they add significant value and attractiveness to a development and can materially increase sale values, occupancy and/or yields.

Several studies from across different countries have found that there is a premium for a property with fiber connectivity ranging between 2% and 4% of the value of the property.

Smart cities in MENA region

The combination of a desire to be the best and lavish funding mean the GCC in particular will see some incredible smart cities and developments.

Considering the world market for smart cities (including infrastructure, technology, security, etc.) could reach $1.5 trillion by 2020*, this is very exciting for the region.

Dubai winning the 2020 World Expo and Qatar's World Cup in 2022 are examples of events driving smart cities and developments forward.

In Qatar, the Lusail development is creating the infrastructure necessary for the World Cup as a greenfield site bound together with fiber connectivity to showcase the country to visitors while also supporting modern living and work environments that will deliver clean, green lifestyles to all.

Dubai is aiming to become one big smart city, while headline developments such as King Abdullah Economic City (KAEC) in KSA and similar developments in Medina, Mecca and elsewhere are focusing around knowledge workers and learning (e.g. KAUST near to KAEC).

Behind these events, the data usage underpinning the connectivity will continue to explode. Having gone up 40x from 2008 to 2013 in the region, a 600 percent increase is expected according to EMC by 2020 – reaching 1,835 exabytes (where an exabyte is 1018 bytes)!

What's the answer to the challenge? Fiber!

So the bottom line is that smart cities and developments require a neutral open fiber network. One fiber network recently carried an incredible 255 terabits/second in a lab test. Even the previous best of 100 Tbps for a single fiber was fast enough to download the entire contents of the library of congress in 10 seconds, or carry ten times the total global traffic on the Internet in 2013!

That's pretty future proof… and it delivers across the range of needs of the city/development!

So the fiber nervous system supports (among other things):

- Transport infrastructure giving:
  - Feedback of real-time traffic / disruption data to route planning tools
  - Prediction of traffic flows/ disruptions/pedestrian flows
- The internet of things including embedded intelligence in transport assets

Why an open network is needed?

A smart city could let a single operator run the network for them. However, if the network is not open, the developer runs the risk of being held 'hostage' by the single operator who knows the developer cannot go anywhere else once an exclusivity deal has been signed.

This can lead to poor quality of service, delays and general issues that undermine the reputation of the development.

In contrast, putting the fibers in place and running an open network has significant advantages for both the network owner (the developer for example) and for business/residential customers.

Some of the benefits of an open network

- Delivers higher take up rates than where a single operator is present – increasing the revenue to the network owner
- Maintains control of the network for the developer to leave them free to exploit future opportunities
- Provides the ability to control contracts and QoS better than in traditional approaches
- Network owner can add extra services on top of communications – generating direct revenue and enhancing rental/purchase values (e.g. layering in security services)
- Creates retail choice and so competition to deliver traditional services (which also drives up-take)
- Promotes creation of new and innovative new service offerings for tenants (e.g. combined fixed/ mobile/content offers)

The type of choice available to people in the smart city is shown in the diagram below, showing an example of how they should be able to use a system to choose from a wide range of retail service providers and specific services – with selection to the service going live happening in 20 seconds or less.

As an example, Vumatel in South Africa have just started delivering what may be the first 1Gbps service in the continent, via a Ventura Next system that connects customers to services like multi-play service providers including MWEB, Web Africa, Smart Village, Cool Ideas and Cybersmart. Such a range of choice for subscribers means happy tenants and higher property values!

Summary
Smart cities need smart infrastructure and that means ultrafast fiber networks, run for the benefit of developers and citizens alike – rather than solely for the profit of a single operator. Failure to implement the network correctly will hamper delivery of new services in the future and potentially limit how smart the city/ development can become. TR

By: Richard Jones, Smart Cities Committee Chair FTTH Council MENA – Ventura Next/ Ventura Team

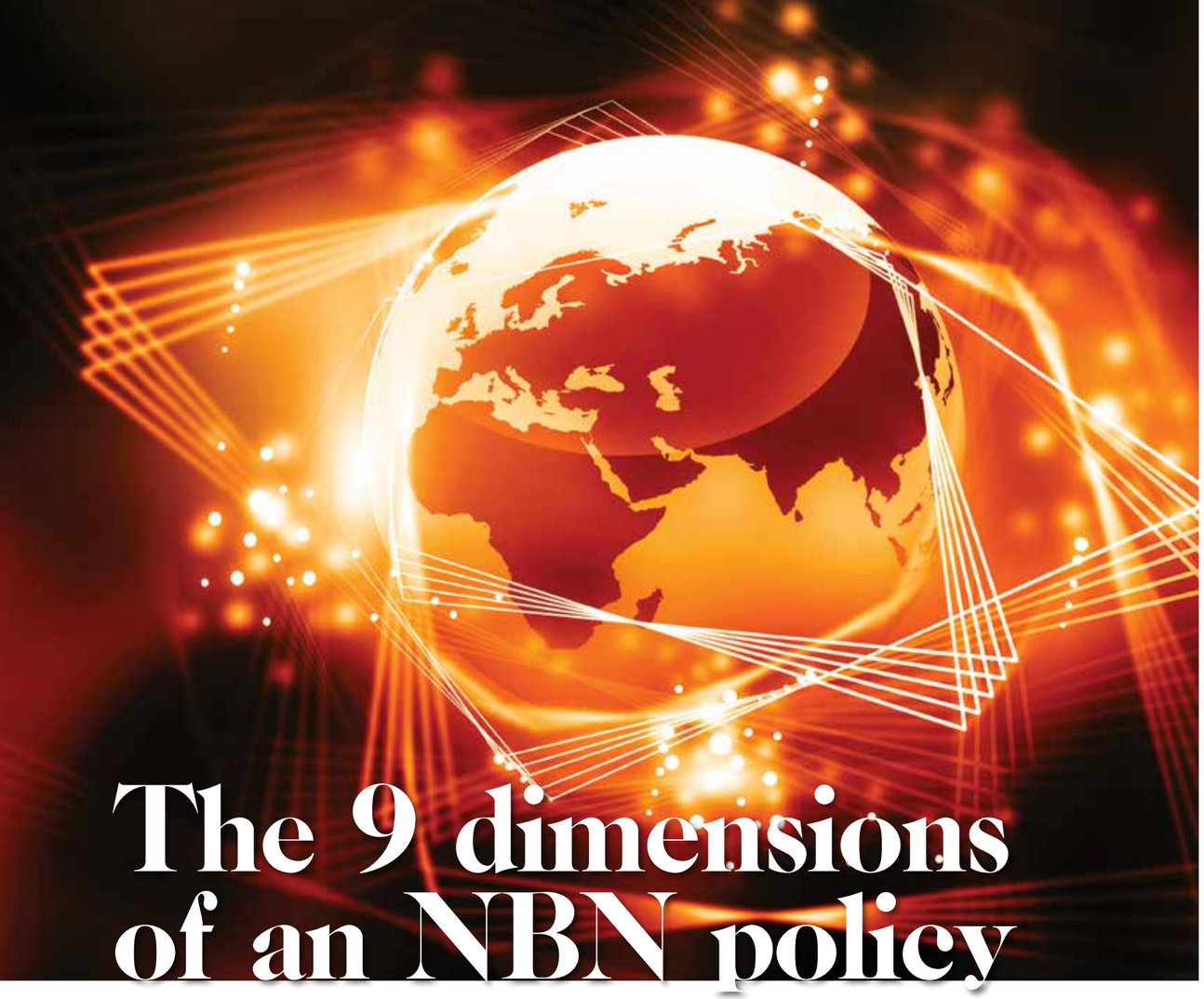
Richard Jones

Chairman of Smart Cities Apps and Ops Committee, FTTH Council MENA Partner, Ventura Next

Richard Jones is the Chairman of the Smart Cities - Operations and Applications Committee for the FTTH Council MENA. He discusses strategy for smart cities and developments in KSA and across the Gulf and Europe. He developed guides and white papers related to Smart Cities and Big Data and contributed in the Smart Cities Guide issued by the Smart City Council in 2013.

Richard is a also a strategic consultant and author who has led cutting edge projects including the world's first 1 Gbps everywhere FTTH incumbent network. The consultancy he co-founded has also bootstrapped its own successful operator in the highly competitive Swedish market, acquired by TeliaSonera for slightly under £50 million in December 2013.

He also trains consultants in one of the 'big four' consultancy firms in techniques, strategy, engagement, and transformation of businesses projects and contributed to product development for companies like Nike, the BBC and Universal Studios. Richard has a Degree in Electronics, a Masters equivalent in Engineering, an MBA with distinction from the University of Warwick, and a PHD in Strategy.



The 9 dimensions of an NBN policy

It has become increasingly clear in recent years that the provision of telecommunications, and in particular broadband, is essential for economic growth and prosperity. While there is rapid expansion of FTTH deployment in some countries of the MENA region (particularly UAE, Qatar and Saudi Arabia), FTTH rollout is limited in other countries due to lack of investment, unclear business models, misdirected or non-existent incentives and regulatory risk.

This pattern is not unique to the MENA region. Governments around the world are examining the status of their infrastructure, assessing the limitations of private sector coverage and deciding whether existing access networks need to be modernized/extended. This process has given rise to the concept of a national broadband network (NBN) which is a ubiquitous fiber broadband network stimulated by government.

FTTH Council MENA is committed through its policy and regulatory committee to strengthen its cooperation with the policy makers, governments and regulators to positively influence relevant NBN policy developments in the MENA region that has an impact on broadband deployment in general and FTTH rollout in particular.

"Policy makers, governments and regulators will need to make the best decisions leading to a successful NBN deployment. We find operators increasingly recognize the merits of getting it right first time with fiber rather than investing in a series of expedient interim technologies and steps," according to Christine Beylouni, director general - FTTH Council MENA.

The Council commissioned a report from Ventura Team to survey the current status of NBN policies in the MENA region in order to identify the most effective generic approach for NBN policy leading to nine key dimensions. As Stefan Stanislawski of Ventura Team noted: *"Approaches to NBN very greatly around the world but everywhere the design of the most effective policy has proven difficult – this is a complex problem with many vested interests, many risks and is a very costly high profile project for any government to undertake."*

So what are the 9 key dimensions of a successful national broadband network policy?

The policy dimensions describe the key factors in industry structure and of incentives for various stakeholders that are the most effective in stimulating deployment of a new NBN based wholly or entirely on fiber access.

1) Geography of the NBN – does it overbuild existing networks or only go into areas with no service? Most NBNs do both putting them in competition with established operators.

2) Where the NBN overbuilds, will the old copper networks be switched off and customer migrated over? It is very inefficient to run old and new networks in parallel so the migration of current customers off copper onto fiber should ideally be guaranteed.

3) Will national telecom regulation be consistent with NBN policy? The recommendation is to aim for a high degree of regulatory consistency wherever it is needed or not to be perfect.

4) Either create a new NBN company or rely on the incumbent? It is generally recommended to create new focused organization in preference to relying on the incumbent which has conflicts of interest and probably little institutional memory of deploying wireline networks at scale.

5) If the country is large enough, set up multiple new regional NBN companies to reduce execution risk – hedge your bets by using more than one management team.

6) Clear, accountable, stable governance is essential for success in any endeavor but challenges remain due to other elements involvement.

7) A high degree of structural separation between passive, active and retail layers (ideally completely separate companies) is much more effective.

8) Some government finance or revenue support will be needed in uneconomic areas and significant private finance adds financial and operational discipline.

9) Universal service should be modernized to fit NBN which means defining in terms of broadband or perhaps access to open fiber and ensuring funding mechanisms efficiently support service to uneconomic customers.

Why fiber is the most common choice of infrastructure type

Optical fiber is the most popular infrastructure for NBN because unlike wireless and VDSl or G.Fast:

- It is the only approach that is completely future proof meaning you invest once and that's it;
- It provides the potential for huge capacity while also costing significantly less to operate (more for less – a direct improvement in national productivity);
- When used with active ethernet fiber is highly secure, reliable and can be shared amongst many different services providers, not only broadband and TV but in the future providing QoS for eHealth, security and yet to be invented new services. TR

Christine Beylouni,
Director General, FTTH Council MENA

Christine Beylouni is the Director General of FTTH Council Middle East and North Africa and member of the FTTH Councils Global Alliance. Since July 2011, she helped the strategic evolution of the council, and was instrumental to increasing membership, enhancing international relations and regulation efforts, and enriching the council's portfolio in terms of technology. She also contributed in the four committees' development and deliverables especially training and related reporting.

Christine is currently acting Policy & Regulatory Committee Chair.

With around 15 years of international experience in the ICT industry and continuously focusing on the regional business and regulatory issues for mobile and fixed sectors, Christine continues acting as a representative for ITU and GSMA on different topics such as broadband, regulatory and international affairs, and overall deep involvement in their regional and global activities.

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FTTH Enhancing Life

Join the FTTH community by becoming official member of FTTH Council MENA

For membership and information contact info@ftthcouncilmena.org

The FTTH Council MENA is a non-profit organization with a mission to accelerate FTTH adoption by all broadband stakeholders through information and promotion, and to accelerate the availability of fiber-based, ultra-high-speed access networks to consumers and businesses. Since its creation in 2011, almost 50 members from vendors, operators, consultants and content providers joined the FTTH community. The members of the board and the committees are all committed to spread the FTTH message and encourage the technology which delivers a flow of new services to enhance the quality of life, contribute to a better economic environment and boost competitiveness.

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