

FEATURE | MEMOTEC

THE FUNDAMENTAL CHALLENGE FACED BY CARRIERS WORLDWIDE IS HOW TO COST-EFFECTIVELY MIGRATE ONTO THE ALL-IP 3G CORE NETWORK*. STRATEGIC AND TACTICAL UTILIZATION OF OPTIMISATION AND AGGREGATION TECHNOLOGIES ACROSS 2G CIRCUIT-BASED NETWORK POINTS ALWAYS ENSURES A CONTROLLED, EFFICIENT TRANSITION TO 3G THAT MAXIMIZES PRECIOUS CAPEX BUDGETS WHILE SAFE-GUARDING EXISTING REVENUE STREAMS.

By Michael Di Paolo, Director Product Management at Memotec (www.memotec.com)

2G/3G Migration: Does media gateway still fit today's market realities and challenges?

The numbers speak for themselves – 3G products and services are rapidly becoming the defacto in broadband wireless networking. As of 2008, 3G subscribers worldwide account for 7% of the world's users, and this growth is expected to rapidly accelerate as 3G networks continue to be deployed at a fast and furious pace. By 2013, may to account for almost 20% of world subscribers, rising to 50% by 2017. And as early as 2012, mobile data traffic would exceed voice traffic an adoption rate greater than that experienced by traditional 2G GSM services in the 1990s.

It may be too late for some but the question outlined here is one that mobile operators should still ask today, particularly as the majority of those new 3G subscribers will come from existing 2G customers - are media gateways needed for the migration to 3G?

THE REALITIES OF MEDIA GATEWAYS IN 2G INFRASTRUCTURES

2G migration to a media gateway and Next Generation Network (NGN) voice core was always promoted as a migration of 2G traffic to an all packet (IP or ATM) core. However, it is clear that churn from 2G to 3G will diminish the need for TDM capacity at the core over the next few years. So why overhaul a working system and migrate to media gateway?

Traditionally, migration solutions proposed the use of media gateways not as a method for optimising the core links, but to use fewer low speed links when compared to a circuit-based full mesh network. Ideally, media gateways would use fewer low speed links, using higher capacity links in a packet switched environment and eliminating many of the mesh circuit based links, to reduce the overall complexity of the core. However, it can be argued that this reduction in complexity is a fallacy. It is actually the incorrect introduction of the media gateway which may create, from time to time, unnecessary and expensive complexity into the 2G architecture. Fundamentally, in 2G networks, the hierarchical structure dictates that all voice traffic be terminated in the Mobile Switching Centre (MSC) and that the MSC is the fundamental control point for the network. But, the only point where meshed voice is an issue is for inter-MSC communications. When media gateways are pushed closer to the Base Station Controller (BSC)/TRAU, it increases the complexity of the network by building capabilities which are readily and available from the MSC. In essence, media gateway architectures add complexity by creating many more points in the network which would require meshing without any clear and observable advantages. This is particularly true in developing countries where MSCs are often located in the capital city, and where 80%, or more, of the voice traffic flows through a star topology.

At the end of the day, media gateway architectures have yet to deliver any OPEX savings or improvements in capacity levels (radio or otherwise). A review of documented product

information from a variety of vendors highlights this glaring deficiency:

- Media gateways are more cost-effectively scalable than MSCs and circuit based networks. Is that really important when an increasing number of mobile operators are abandoning expansion of their 2G network to invest more in 3G networks?

- Reduced complexity.

Debatable. The hierarchical solution is not complex but the resulting new media gateway /MSC server is a far more complex network architecture to manage.

- Local switching ability at the BSC is a recognized capability of the media gateway architecture.

This approach is practical only if the mobile operator deploys a BSC and TRAU in a remote location, since calls can then be switched locally thereby reducing the bandwidth available in the backhaul. However, traffic from the TRAU to the media gateway is typically 64kbps G.711 voice instead of the more efficient GSM/AMR codecs supported across the Ater interface. Since media gateways require packet backhaul, the resulting backhaul of media gateway traffic (SIP sessions support transport of 64kbps voice) is typically greater than the backhaul capacity. This would have been required had the links been brought back to the core as Ater traffic. Furthermore, since bandwidth between the remote media gateway and the core is allocated for a set percentage of local and remote traffic, it is likely to experience a lack of capacity to support all the call capacity toward the MSC in case of emergency. This would not be an issue if backhaul was Ater.

- The media gateway architecture does not provide any apparent cost savings. Again, in reviewing numerous vendor documents, there was no clear point made about this media gateway architecture providing OPEX savings, improving capacity (either radio or otherwise), reducing backhaul expenses, etc.

RESPECTING THE VALUE OF 2G INFRASTRUCTURES DURING MIGRATION TO 3G

Of course, OPEX savings are a priority for mobile operators faced with the reality of supporting a 2G subscriber base for another 10 years amidst decreasing voice ARPU. Memotec customers have deployed 2G/3G optimisation solutions that cost effectively support older generation mobile technologies, and minimise OPEX through a reduction in their backhaul expenses without sacrificing capacity. Memotec's solutions enable mobile operators to optimise and aggregate 2G traffic at Abis, Ater or A interfaces and statistically multiplex it with ATM or IP traffic from



the 3G nodes over a common ATM IMA or IP/MLPPP bundle (or Ethernet trunk if available). Over the next few years, as 2G subscriber traffic dwindles, backhaul capacity can then be transparently shifted to the 3G network through the aggregated links. Essentially, by deploying Memotec 2G/3G optimisation, mobile operators can forget about Abis traffic and focus on building their higher capacity 3G network, while preserving 2G voice revenue.

One of Memotec's strategies which has paid dividends in reducing 2G costs is the utilisation of voice compression to reduce bandwidth and aggregate traffic onto combined 2G/3G network, while enabling the 2G network migration to a packet core. Memotec's higher order voice compression solution supports remote TRAU and BSC and provides better backhaul bandwidth utilisation. It furthers the art of compression with Voice Quality Enhancement (VQE) techniques that improve voice quality by eliminating noise, echo, and hissing through dynamic gain adjustments that deliver the best user experience. These advanced compression implementations also achieve bandwidth reductions of 16:1, freeing up capacity for 3G traffic on existing links while maintaining high service availability without additional backhaul expense.

TRANSPARENCY & RAPID TIME-TO-MARKET DCME or Abis/Ater/3G optimisation & aggregation solutions integrate seamlessly into existing 2G mobile network infrastructures. Installation processes are straight forward and are achieved in a matter of days, avoiding interruptions to revenue-generating operations. For more than a decade, mobile operators worldwide have been relying on the proven capabilities of optimisation and aggregation techniques

ADVANCED COMPRESSION IMPLEMENTATIONS ALSO ACHIEVE BANDWIDTH REDUCTIONS OF 16:1, FREEING UP CAPACITY FOR 3G TRAFFIC ON EXISTING LINKS WHILE MAINTAINING HIGH SERVICE AVAILABILITY WITHOUT ADDITIONAL BACKHAUL EXPENSE.

to improve time-to-market for new 3G services while ensuring CAPEX and OPEX budgets are respected.

KEEP YOU CAPEX FOR MORE 3G CAPACITY The migration to media gateway/MSC server architecture provides debatable advantages. Many mobile operators are rather optimising their 2G networks and focusing the bulk of their resources on building 3G capacities. A strategic and tactical utilisation of technologies, such as Abis optimisation and aggregation, or a selective application of voice compression and VQE technologies, across 2Gs circuit-based networks ensures a controlled, secure and efficient transition to 3G packet based networks, while maximising precious CAPEX budgets and safe guarding existing revenue. ■



Revitalize your network

TIRED of getting dropped calls?

Support your growth - Get the LATEST DCME voice compression technology from MEMOTEC.



Save the Planet: Maximize your Network

WWW.MEMOTEC.COM/DCME

MEMOTEC
redefining network efficiency

Infrastructure	Technologies	Services
leased lines	2G and 3G	Voice
microwave	DCME	Video
satellite	PDH and SDH	Multimedia
mobile	ATM and IP	DATA