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Technology Sunset

Navigating a path from legacy technologies to the future

In this short paper, Amr Maged, Founder and Chief Strategy Officer, Digis Squared provides more detail on some of the ideas shared in his blog post, www.digis2.com/technology-sunset/

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In this short paper we consider the benefits and issues of re-farming spectrum, and the scope and timelines of such projects. Please get in touch if you would like a more detailed, exploratory conversation about how we can help you with your technology sunset projects.

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1. Pro's & con's of re-farming 2G and or 3G spectrum

	Why keep it?	Why switch it off?
2G & 3G (Keep one of them, but arguments apply to both)	<ul style="list-style-type: none"> When VoLTE not available, voice calls falls back to 2G or 3G network (CSFB, circuit-switched fall back). Calls from a VoLTE handset to a 2G/3G handset use CSFB over 2G /3G. Early implementations of eCall service in Europe use 2G/3G for the voice call element of the mandatory service – no plans were made to be able to replace the equipment in these vehicles. Most IoT devices don't need the high bandwidth 4G and 5G deliver, and can make service cost prohibitive. 	<ul style="list-style-type: none"> Re-allocate spectrum: new 4G and 5G technologies are more efficient and more capable, delivering enhanced speed, bandwidth and security. Operational cost optimisation. IoT: LPWA-LTE, NB-IoT and other new technologies maximise battery life and battery cost, data usage, indoor coverage, and have lower cost modules. Regulatory driven spectrum reallocation and or harmonisation.
2G	<ul style="list-style-type: none"> 3G devices can "roll down" to 2G connectivity. Support 2G-only consumer handsets –typically low income, or elderly seeking simpler devices. Support 2G-only M2M devices <ul style="list-style-type: none"> Early M2M devices in tricky to reach geographies, or deep within long-life equipment (cars) and never designed for replacement. Early implementations of eCall service in Europe (uses 2G/3G for the voice call element of the mandatory service.) IoT devices deep inside buildings (indoor coverage). 2G base stations can be installed further apart – robust voice services over large territory, more efficiently than 3G. Smaller carrier bandwidth spare, enables more bandwidth for 4G and 5G. 	<ul style="list-style-type: none"> Generally, lower number of 2G-only users than 3G, and lower ARPU 2G delivers lower spectral efficiency than 3G. 2G voice calls are lower quality than 3G. Very limited data services in areas with no 4G coverage.
3G	<ul style="list-style-type: none"> Some MNOs: 3G network costs not yet amortised. 3G & HSPA provide far better data experience than 2G. Multi-RAB concept give 3G users the option of having both voice and data services simultaneously. Performance of 3G interoperability with 4G + 5G is far better than 2G interoperability with 4G + 5G. 	<ul style="list-style-type: none"> 3G devices can "roll down" to 2G connectivity. Re-use 3G spectrum to add more capacity to LTE networks + expand 5G networks. 3G is not operating in band 3 (1800 MHZ band), the most famous 4G band - this is a significant limitation from the point of view of technology combination.

2. Technology sunset timeline

Whilst all projects vary, this indicative timeline highlights key milestones on the path from legacy technologies to the future.





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