

Architectural Assessment – Telefonica

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Performed by NTT Data.



Terms of Reference – NTT Audit of Telefonicas Smart Meter E2E Architecture and Operational delivery.

Purpose

- An independently led assessment of Telefonicas Infrastructure, Applications and the architecture of the Smart Meter solution.
- Telefonica appointed NTT to perform the activity.
- Analysis to highlight risks, opportunities to improve in a variety of areas identified within the scope of the audit
- Recommendations to be presented to both Telefonica and DCC Leadership team

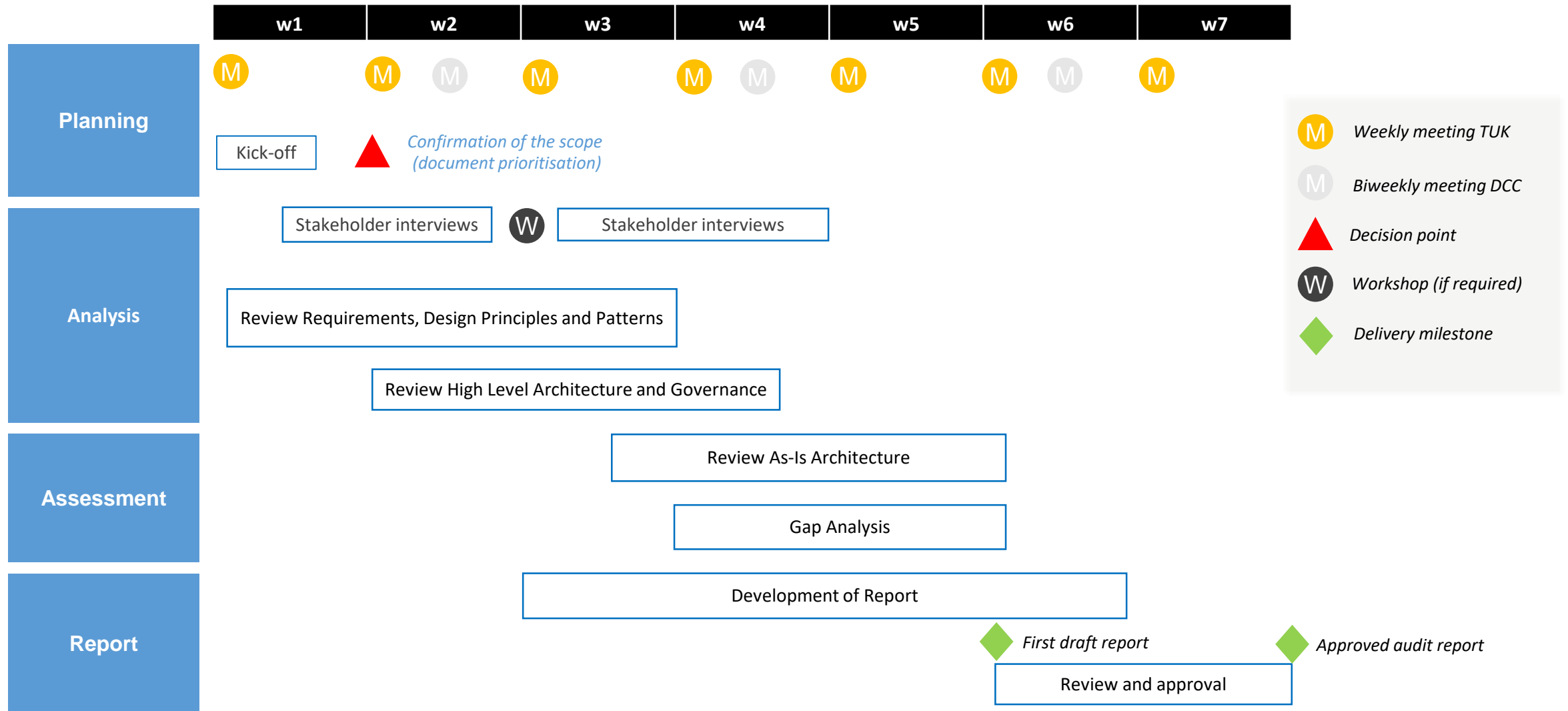
Scope (Slide 3 contains more detail on scope)–

- Over a 7 week period NTT outlined an approach to –
- Engage with key stakeholders
- Evaluate the architecture, design, scalability, reliability and Operational model.
- Define governance both during and post review.

Stakeholders –

- NTT Lead / architects
- Telefonica Service Management
- Telefonica Operational Teams
- Telefonica Design / Architectural leads
- DCC Service / Operational leads
- DCC Service Design / Architects
- DCC CTO / COO

NTT's approach over a 7 week period



Smart metering assessment scope

The following topics were identified for consideration for the assessment after discussions with Telefonica and DCC

Topics	Coverage
Operate at scale	<p>The review will cover the solution as it is today and the potential impact of the demand forecasted and whether the solution can scale in the future. The areas of specific focus will be:-</p> <ul style="list-style-type: none">• Capacity bottlenecks and pain points• Sizing (forecast vs actuals)• Resilience and failover• High availability• Monitoring• Disaster recovery• Change without downtime <p>*However, the operate at scale review will not be focusing on reviewing service level agreements and contracts but will consider these to be inputs where relevant</p>
Architecture review	<p>The architecture and design review will focus on the implementation gaps against the baseline architecture</p> <ul style="list-style-type: none">• Gaps in implementation vs design with a focus on test coverage during implementation• Infrastructure & technical architecture with a focus on environments• Rationalisation opportunities (Mobile vs Smart meter, Non prod vs production) <p>*Security architecture and architecture standards will not be a focus area for the architecture review</p>
Governance review	<p>The governance review will focus on the operating model and governance being in place for success at the scale that is forecasted with a focus on the following areas:-</p> <ul style="list-style-type: none">• Delivery operating model – governance setup to handle the forecasted growth and scale• Change governance – Change control setup to handle the future growth and scale <p>*The implementation governance for the delivery of past programme or other programmes or the wider organisation outside the SMIP will not be a priority for this review</p>

Overview of assessment based on RAGs definition

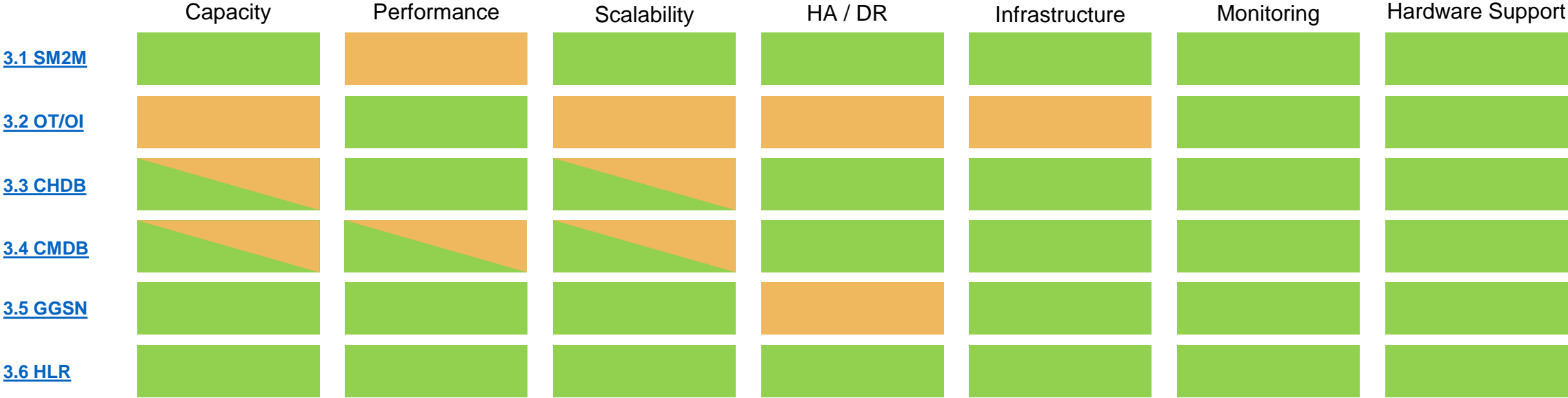
1.0 Enterprise level



2.0 Process level



3.0 Key applications



4.0 Other focus areas



Recommendations – Basics & Essentials (1/2)

	Recommendation	Area
Specific topics - Basics & Essentials	TEF to feedback actual values for the traffic model and daily installs to DCC to be included in future forecasts	Forecasting
	TEF should use current actuals to deduce an average peak profile (e.g. the highest peak per day is between [start time] and [end time], when x% of the installs are taking place), which we recommend to then be used to forecast peak install rates and be fed back to DCC for future forecasts	Forecasting
	Implement a centralized E2E capacity management process, including: <ul style="list-style-type: none"> E2E dashboard level view of capacity break points and lead times E2E alignment and prioritization of capacity upgrades Per application clarity of capacity limits, throughput and utilisation levels Volumetric models that accounts for spike scenarios Continuous feedback loop, ensuring alignment of forecasts, capacity plans and performance results 	Capacity (across all applications)
	End to end performance testing should include: <ul style="list-style-type: none"> Updating load and stress testing volumetric models to better align with live Improve monitoring in performance test environments to gather more meaningful results from test runs 	Performance testing
	<ul style="list-style-type: none"> Validate the scalability of TrueSight to handle the volumes of monitoring data needs Accelerate monitoring implementation plans where possible 	Monitoring



Recommendations – Basics & Essentials (2/2)

	Recommendation	Area
Specific topics- Basics & Essentials	Prioritize incoming event types so that it should protect against non-batched FW uploads	SM2M - Performance
	Investigate possibility to check for the existence of a FW file before copying to the file store to avoid unnecessary FW writes (e.g. DMM keeping a history of file checksums already copied)	SM2M - Performance
	Investigate why the Comms Hub Time Sync is reset when the hub is off the network	SM2M - Performance
	Maximise single-server workflow availability by automating alarms and redeployment in case of single server failure	OT/OI – HA/DR
	Deploying a larger number of GGSNs per site will limit the effect of a single failure and reduce recovery time	GGSN – HA/DR



Recommendations – Investigate further to Modernise/ Rationalise

	Recommendation	Area
Investigate further - Modernise/Rationalise	Shift the performance testing pass/fail culture to a cross functional setup of continuous performance engineering culture	Platform
	Investigate possibilities to reduce complexity and modernise the platform (e.g. refreshing to a new cloud native platform like Azure IOT)	Platform
	A lot of capacity is in place in the DR estate that can be repurposed (e.g. use by performance engineering or blue green deployments or as being used for failover)	Capacity
	Performance testing environment is currently at 50% capacity of live, investigate uplifting this fully representative of live	Performance testing
	The process ownership and governance as part of an operating model review can be explored further. This can provide a more top down view of the processes compared to the bottom up views pieced from applications	Governance
	The siloed nature of ownership across Applications, Infrastructure and Database teams needs to be investigated as part of an operating model review to enable better collaboration. Full stack cross functional ownership needs to be explored as part of such a review	Governance

Governance and next steps

- Recommendations were presented back to DCC and Telefonica by NTT.
- Specific Actions and Owners were derived from the recommendations and assigned across both organisations.
- Progress has been tracked in various forums – Service Review, OMR and then fortnightly TEF / DCC Service Management sessions where progress is updated.

Actions –

There are 23 specific actions that we are tracking with the DCC.

7 Actions are complete.

3 Actions of long-term actions eg. Establish a governance forum to track innovation and 3-5 year planning with the DCC. Develop a testing strategy, led by DCC, to use established testing principles to performed 'Ecosystem' E2E testing.

13 In progress (Deployments via CR imminent) eg.
Delivery of SAN storage, removing NFS from critical path – (Stability)
Performance testing actions complete – now sub actions to deploy changes to further improve stability, reliability and E2E performance.