

This document was produced by IBM for presentation to the TSB Board on 29 April 2018. It contains a preliminary work plan with very early hypotheses, produced after just three days of engagement with TSB. These hypotheses were not final nor were they a validated view of what went wrong or of the actions that may or may not subsequently have been taken.

IBM CIO Leadership Office - Update for TSB Board

29/04/18 @ 1300

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Initial IBM Actions

Complete (expected at 17:00, 29 April)

- Initial briefings on conceptual architecture and key issues completed
- Established cross-discipline team of 15 (based in UK and Spain)
- Mobilised additional skills (20+) needed to address identified hot spots in the architecture
- Requested architecture, configuration and logging information for identified hot spots
- Engaged in Gold Room meetings and Business/Channel War Rooms
- Commercial agreement between TSB and IBM established

In progress

- Establishing the CIO Leadership Office, including Technical Design Authority
 - Determining decision making, incident and problem management, RCA and change control processes

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Early Findings/Observations: Post Go Live

- Whilst Business War Rooms are structured by Channel and appear to be effective in triaging Business issues to enable both technical and operational defect remediation, they do not integrate technical change, i.e. change could be made to the same architecture component by different War Rooms without a holistic assessment.
- The short term focus should be stability, enforced by central design authority working with the business and the IT run organization to do defect triage and determine the priority of fixes:
 - There is a very high volume of continuous change in production due to frequent deployments. This will continue to destabilise the production service to customers and branch partners.
 - It is standard industry operating procedure during incidents of this severity to reduce change (especially functional) to the absolute minimum in order to maintain control.
 - In order to provide short term stability, channels have been isolated to single data centres. Loss of any one data centre during this period will result in an extended outage for the channels working from the impacted data centre.
 - The current analysis approach should be more data driven, substantiated through rigorous testing and use of production monitoring data.
- Most of the observed problems are related to custom and package applications, middleware services and the network, rather than the underlying infrastructure.
 - Infrastructure capacity can be used to bring short term relief, while the underlying application, middleware and network problems are resolved.

Early Findings/Observations: How did TSB get here?

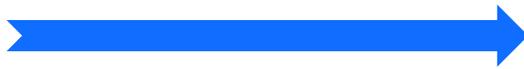
- A combination of new applications, advanced use of microservices, combined with use of active-active data centres, have resulted in compounded risk in production:
 - This demands extensive engineering, testing and proving, as well as significant mitigation strategies, including roll-back.
 - This scale and complexity require longer than normal to prove the platform through incremental customer take-on to observe and mitigate any operational risks.
 - The complexity results in a broad range of technical and functional problems that are hard to diagnose.
- To address this risk profile, IBM would expect world class design rigour, test discipline, comprehensive operational proving, cut-over trial runs and operational support set-up:
 - A limited number of services, (e.g. mortgage origination, ATM and head office functions) were launched on the new platform and a broader set of services to approx. 2000 TSB Partners as customers.
 - IBM has not seen evidence of technical information available to TSB, e.g. architectures, configuration and design documents, monitoring information, test outcomes, etc.
 - Performance testing did not provide the required evidence of capacity and the lack of active-active test environments have materialised risk due to issues with global load balancing (GLB) across data centres.
 - IBM has not seen evidence of the application of a rigorous set of go-live criteria to prove production readiness.

In a similar situation when IBM partnered with a financial organisation to migrate to new a core banking platform, multiple trial migrations were conducted, rolled back and then remediated prior to launch. The production launch was done over a longer period, initially open to programme members only, then staff, then targeted customer groups, before full launch to new customers and subsequent migration.

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Route to: Stabilising the service; Remediating “Hot Spots”; and Transitioning back to the Target Architecture

1. Immediate actions
 1. Short term capacity interventions
 2. As-is assessment of infrastructure
 3. Review of available documentation
2. Disciplined engineering approach to remediate eight focus areas
3. Incident closure report
4. Path back to target architecture:
 1. Review target architecture E2E (application, infrastructure, integration, resilience, management, security, automation)
 2. Recommend and propose to remediate architecture and move to sustainable operating model.



Micro Services - tool driven quality review
OpenAM - configuration and sizing for Active/Active
Actimize - rules and capacity
Exadata - data topology and configuration
Network - load balancing and DNS set up
WebLogic - Internet Bank memory and performance
Telephony - capacity and interfaces
Branch – assessment of current situation

CIO Leadership Office: Principles, Approach & Ways of Working

Principles

- Stabilise service by focusing on the customer and partners experience
- Provide fast and informed decision making
- Report to TSB CEO and integrated with TSB leadership

Approach

- Protect the production service through focused testing and controlled change
- Coordinated leadership in Bristol and Barcelona
- Technical SMEs in Bristol and Barcelona
- Technical SMEs engaged with TSB War Rooms
- Draws upon IBM SME resource pool for focus areas
- Daily stand up calls to maintain pace and coordinate

Ways of working

- Provide guidance during incident triage to help find best course of action
- Request further information following resolution of an incident to identify problem(s) and inform RCA
- Require additional information to be provided to assess the potential impact of proposed change(s)
- Request design, build and test information to understand systems behaviour under different conditions
- Request further investigation through monitoring and logging in production or focused test activity
- Recommend course of action based on evidence to change, test and deploy components
- Provide regular updates on progress to achieve stability and to return to architecture

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Near Term Goals

- Next 2 days
 - Will have received requested information from TSB/SABIS
 - to estimate timescales
 - to determine likely causes of symptoms for eight focus areas and prioritise further action.
 - Determined further skills required to address identified issues
 - Completed a subset of the immediate actions (see Immediate actions aimed at improving client experience)
 - Completed an initial assessment of branch and telephony problems and agreed immediate actions
 - Established a working technical design authority
 - Published an initial plan for next two weeks
- Next week
 - Mobilised further skills required in Bristol and in Spain
 - Completed agreed immediate actions (see Immediate actions aimed at improving client experience)
 - Drafted plans for addressing branch and telephony actions
 - Refined plan for next two weeks

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Immediate actions aimed at improving client experience

Category (* TBC 30/04)	Technical Action	Justification	Business Impact	When
Prioritise telephony and Branch channel*	Reconfigure F5 to prioritise network connections or dedicate one data centre for these two channels.	Large volumes from Internet and Mobile banking is causing additional stress on systems. By getting branches, telephony and call-centre working properly, they can help customers and start to reduce complaint volumes.	Internet and Mobile banking will get worse before it gets better. However, Telephony and Branches will perform better across user journeys.	TBD – need to agree
Fraud*	Reduce the number of times Actimize is invoked in user journeys. Keep it for payment related journeys. Do a rules review and comparison with pre MME rules for both retail and commercial customers.	Create more capacity to allow Actimize to more fully support the payments journey. Ensure that rules are configured as expected for payments.	More successful payment submissions, but disadvantage is additional risk of fraud.	TBD – need to agree
Throttle connections	Configure 1 st network F5 load balancers to queue and throttle connections. Most F5 offer to queue (slow-down), pass-through or throttle (rate limiting) connections at different limits.	When volumes are low, things are working. Therefore, by limiting the number of inbound connections, we can serve a proportion of customers more consistently.	+ Consistent service for smaller set of customers throughout the day. - Higher impact on internet and mobile.	1/5
Load balancer configuration	F5 – Routing algorithms and other configuration items.	Investigate the routing algorithm configured in F5. Using latency based algorithm might be better than round-robin.	Ability to serve more customers by making better use of existing capacity.	1/5
Additional Capacity	Add more memory + CPU for OpenAM, Actimize and MicroServices.	Provide more headroom before systems slow down under stress.	Delay symptoms for customers by creating more headroom.	30/4
Infrastructure	Storage configuration assessment Network configuration assessment	Risk mitigation as some symptoms might be caused by configuration issues in storage and networks.	Increased confidence in key elements of infrastructure.	4/5
OpenAM invocations	Reduce the number of times OpenAM is invoked. Current understanding is that every micro service and interaction validates tokens. Identify specific services that are isolated and internally accessible only and stop OpenAM validation temporarily.	Reduce the load and transactions being sent to openAM.	Need careful evaluation of how micro services are orchestrated and handpick the ones that need changing with lowest risk in specific journeys.	4/5