

Revision Control

Date	Version	Notes
20/4/2017	1.0	Initial document generation following internal review at Beecham Research.
25/4/2017	1.1	Following internal review at IMC. Section 2.0 and 4.0 - Addition of satellite to 'connectivity types'. Addition of Low Latency to 'application requirements'. Footnote on vertical specific market forecasts in 2.4. Header 4.1.1 replaces PaaS with 'Platforms'. 4.3 Added reference to integration of major backbone software systems.
16/5/2017	1.2	Following initial feedback from IMC vendor community. Device connectivity details updated and widened to include more options (2.6). Added 'Environmental requirements' as a distinct section (2.6.1). In 4.1 Updated connectivity options, Integration with 3 rd party order/management systems. Standards compliance question added. In 4.2 Additions made to industry specific protocols. In 4.4. Changed title to read 'Enablement & Development'. Additional questions on Partner Management, Standards Compliance and Microservices. In 4.5 Added question on Joint Go-to-Market capabilities.
18/5/17	1.3	Ongoing feedback from IMC vendor community In 4.2 addition of 'Connectivity Support' In 3.1 elaborated on 'History and Market Experience' Added 3.4 'Professional Services support' (<i>In the context of re-engineering of business processes resulting from IoT platform implementation</i>) In 4.1.2 updated 'Cloud Storage' question (response prompt) In 4.2 Added 'Device Estate Management' response prompt and '3 rd party IoT gateway support'. In 4.5 Amended 'Application Management' to 'Application Development and Modelling' with related response prompts added In 4.5 Added 'Augmented Reality/Visioning' with related response prompts.
19/7/17	1.4	Added 4.7 - Security Provisions Deleted security related functionalities in 4.1, 4.2 and 4.4 Clarified 4.0 Supplier Offerings nestings by platform type. Addendum: Added 'References to IMC Validation Process.
20/7/17	1.5	Throughout 4.0 'Functionality' replaced by 'Evaluation Criteria' Changed in 4.1 – 'Fault management procedures, Help Desk and SLA criteria' Changed in 4.1 – Evaluation Criteria, 'Connectivity Options, Network Protocol Support & Industry standard' Added 4.1 – Question on OTA provisioning

		<p>Added 4.1 – Question on coverage</p> <p>Added 4.2 – New evaluation criteria Real Time Alarm Management, Deployment Templates, Visualisation & Remote Monitoring Tools</p> <p>Added 4.4 – Forecasting Techniques question.</p> <p>Added 4.5 - Application Lifecycle management, Hosting & Cloud services question.</p> <p>Added 4.5 – Integration with external application development tools question.</p>
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Confidentiality Notice

In Sections 1.0 and 2.0 an adopter/potential adopter (The Company) is describing their business. Although much of the information offered is in the public domain, some concerns strategy and specific plans relating to the RFP. With this in mind, a statement along the lines of the following should precede the RFP...

This document is confidential to *The Company* and may be used only by organisations responding to this Request for Proposal

Information provided in this document, its annexes and/or enclosed are the proprietary of The Company and must not, at any time and/or under any circumstances, be disclosed, imbedded, transmitted, used in any shape or form without written permission from The Company or its designated authority and only for the purpose it is intended for.

This document (which is designated as an RFP – Request for Proposal) illustrates the business and technical requirement for the supply, delivery, installation and commissioning of goods and/or services required for the purpose described below, and it DOES NOT in any shape or form replace The Company purchasing contract which the bidder must comply to at all the times.

1.0 Executive Summary

1.1 Company Background

Who are we? What business are we in? How are we doing?

Description of business operations

- Products and services offered
- Markets served.
- Financial profile:
 - o Reference published reports for last FY
 - o Trend financials over past 5 years
 - o Number of employees
- Geographic reach
- Company vision/Mission Statement

1.2 Summary of Requirements

Why are we looking for an IoT Platform capability?

- Outline of Short and Long term strategy
- How strategy fits with this project and issuing of RFP
 - o Develop new revenue streams
 - o Control and reduce costs (Operational, manufacturing, development)
 - o Asset management
 - o Part of an existing product or service development
 - o Enhancement to existing product/service

What is the nature of our project?

- Description of project referencing 'Why?'
- Expected outcomes from implementation of this project
- Expected timescales

1.3 Expectations from this RFP

How will we go about this project? (Information needed from suppliers, evaluation criteria, award of contract criteria)

We are inviting potential suppliers to respond to this RFP, proposing an IoT Platform solution. The evaluation of suppliers will be based on:

- The IMC validation process
- Case studies of relevant applications
- Geographic reach of the service
- Demonstrable track record of integrating customer specific software and working with 3rd party OEMs
- Pricing options for different levels of service

1.4 RFP Criteria and Timescales

Award of Contract criteria:

- As detailed in 6.0 'Selection Criteria'
- Compliance with timescales
- Post implementation flexibility to respond to changes in requirements
- Total contract price

When? Selection process timescales and deadlines.

List of Key contacts:

Name	Job Title	Contact Details

2.0 Statement of Purpose

2.1 Objective of the RFP

- Expected outcomes resulting from the response to the RFP
- How these relate to strategic objectives

2.2 Business Case Supporting this RFP

- Level of support for this project (Board, C-Level, Result of M&A activity, External Investor etc.)
- Operational support
- Cost and Schedule confidence levels (Budget Approval)
- KPIs of supporting Business Case
 - o ROI, NPV of investment
 - o Market share targets
 - o Revenue per customer/revenue per unit sale

2.3 Schedule of Service Rollout

- By Geography
- By Country
- By Product/Service type

2.4 Forecasts

- Markets to be served
- Market forecasts underpinning the business case.¹
- Effect of variations in market forecasts on business case.

2.5 Technical Requirements

- Type of project; e.g. Monitoring, Command & Control, Data Acquisition, Asset Tracking etc.
- Expectations of connectivity type; e.g. Wifi, Cellular, fixed, LPWA, Satellite.
- Application requirements, e.g. Low Latency.
- Market specific hardware interface requirements
- Market specific software interface requirements
- Market specific network protocol requirements

¹ Vertical market forecasts to be added in future market specific RFPs

2.6 Device Connectivity details

Description of how the end-point device will connect to the IoT platform. This could be any one of the following or use more than one method depending on project requirements.

- Standard SIM or eSIM for cellular connectivity
- Stand-alone cellular communications device
- Non-cellular network, e.g. LPWA.
- Satellite
- Multi-network gateway e.g. MESH to cellular gateway, Cellular to LPWA
- Fixed telephone connection e.g. broadband.

2.7 Environmental requirements

What kind of environment does the end-point device operate in? e.g. temperature, humidity, dust, vibration.

3.0 Supplier (Bidder) Profile

Who are you?

3.1 History and Market experience

- Overview of the bidder, including location of headquarters, scale of operations and locations.
- History of the bidder and experience in the relevant business.
 - o Case studies (anonymous)
 - o Relevant industry events attended
 - o Awards, achievements and recognition in the industry

Is your business financially sound?

3.2 Financial Stability

- Supplier will provide past 3 years financial reports.
- Revenues relative to the provision of these services.
- Percentage of revenues dependent on top 10 customers.

In the context of a long- term supplier relationship

3.3 Supplier Five Year Roadmap to 20xx (year)

- Supplier to share expected developments of their business and relevant services.
- Supplier will provide a credible Business Continuity Plan (BCP) to ensure service delivery for a period of xx years.

In the context of re-engineering of business processes resulting from IoT platform implementation.

3.4 Professional Services Support

- What services are provided to help/guide the IoT implementation?
- What pre and post sales training and support are available for our staff?
 - o On the platform
 - o On IoT in general
- What experience, with case studies, can you bring to our organisation on how the implementation of an IoT solution affects other aspects of our business, strategy, go to market and revenue models?

4.0 Supplier Service Offerings

Tell us what you are offering and how you will meet our requirements

IoT Platform Capabilities required as follows:

- 4.1 Connectivity Management
- 4.2 Device Management
- 4.3 Data Management (Storage, Modelling, Analytics)
- 4.4 Data Analytics
- 4.5 Application Enablement & Development
- 4.6 Generic Capabilities, e.g. pricing models and ecosystems.
- 4.7 Security Provisions

4.1 Connectivity Management

Please provide detailed descriptions on the functionality of the platform, these to include the following Evaluation Criteria as guidance but the responder is invited to include additional information on their connectivity management services.

Evaluation Criteria	Response Prompts
Connectivity Options, Network Protocol Support & Industry standards	Is the platform technology agnostic when it comes to connecting devices? What types of network connectivity does the platform enable (e.g. Wifi, Zigbee Cellular, LPWA, Satellite etc.)? Description of public and private connection options (e.g. MPLS for added security). Does your platform comply with leading industry standards such as 3GPP, GSMA, oneM2M, etc?
Order Provisioning Management	How are orders placed, processed and provisioned on the platform? What is the typical time between placing the order and the asset being connected? Can the platform support integration with 3 rd Party Order/Management systems? Can the connected estate be managed via a portal? What hardware and software are required for access to the platform? How are additional connected ordered? Existing subscriptions changed? SIM activated/deactivated?
Coverage	Please describe the geographic coverage offered at the global, regional and local levels
Subscriptions Management & Over The Air (OTA) provisioning.	How are subscriptions managed, new connections added, data plans changed? Is OTA provisioning offered? How scalable is the platform? Is there an upper limit on the number of subscriptions supported on one account? Which profiles are supported (eSIM, multi IMSI SIM)?
VPN Integration	Describe the VPN integration options offered
IP Addressing Mechanisms and Access Point Name - APN (private and public) provisioning	Are both static and dynamic IP addressing offered? Can contiguous static IP addresses be provided within a private APN? Are both public and private APN provisioning offered? Describe how naming is implemented for new connections or changed for existing connections

<p>Fault management procedures, Help Desk and SLA criteria</p>	<p>Describe the reporting procedure for loss of one or more connections. Describe the rectification of faults and notification processes relating to loss of connection or loss of services. 24x7 help desk? Are SLAs on the performance of the service offered? How are SLAs measured and reported? What are the criteria for SLAs met/not met? What QoS metrics are used to monitor SLAs? How are these reported? Please outline the administrative capabilities such as service desk capabilities, disaster recovery management and etc.</p>
<p>Billing, tariff, and usage management</p>	<p>How is billing data collected? How is rating and charging managed? How is the bill presented? What options are available on the billing system. What tariff options/bands are available? Is data pooling of SIMs an option? Describe volume discounting policy. Are both manual and automatic usage monitoring options available?</p>
<p>Connectivity Analytics</p>	<p>What type of metrics are used to assess network conditions and behaviour? Is it possible to run predictive analytics on the conditions of the network?</p>

4.2 Device Management

Please provide detailed descriptions on the functionality of the platform, these to include the following Evaluation Criteria as guidance but the responder is invited to include additional information on their Device Management services.

Evaluation Criteria	Response Prompts
Device discovery, Configuration and settings.	<p>Does the platform support automatic device discovery and registration?</p> <p>Does the platform support devices using different types of connectivity or combination of different types of connectivity?</p> <p>Does the platform provide remote configuration and setting control of devices?</p> <p>How are newly connected devices configured? Are templates available for batch deployment?</p>
Device health monitoring	<p>Does the platform enable the remote health monitoring of the device/asset? Are failures detected and relevant analytics (e.g. descriptive analytics) performed?</p>
Device Estate Management	<p>Is there a portal interface to view and manage the entire connected estate of devices? Does it have reporting capabilities? Please describe its function and capabilities.</p>
Real Time Alarm Management & OTA firmware & Software updates	<p>Does the platform support real time alarms? Can alarms be re-set OTA? Can device firmware & software be updated OTA? Singly or in batch mode? Can the edge application running in the device be activated, suspended, updated directly OTA and/or using APIs?</p>
Device Libraries Support	<p>What industry specific protocols are supported? This gives some indication of the range of devices the platform can support. Examples would be CANBUS for the transport industry, CIP (common industrial protocol), OSGP (Smart Grids), OMA-DM (cellular based devices) LWM2M.</p>
Scalability, Performance & High Availability	<p>Please outline the Platform's technical capabilities regarding Scalability, Performance, High Availability?</p>
Edge Analytics	<p>Does the platform support analytics-rich devices? Does the platform provide analytics at the edge?</p>
Deployment Templates	<p>Does the platform support both single and batch deployment?</p>
Usage-based metrics and notifications	<p>Can device parameters be monitored? Are notifications/alerts supported when device goes outside of normal parameters?</p>
Visualisation & Remote monitoring tools.	<p>Does the platform support visualisation and remote monitoring tools?</p>
Third Party Gateways.	<p>Are 3rd party IoT gateways supported on the platform? If so which ones?</p>
Decommissioning Services	<p>What decommissioning services are offered?</p>

4.3 Data Management (Storage & Modelling)

Please provide detailed descriptions on the functionality of the platform, these to include the following Evaluation Criteria as guidance but the responder is invited to include additional information on their Data Management services.

Evaluation Criteria	Response Prompts
Data Storage	Does the platform provide data storage? What are the data storage options that the platform provides (e.g.Hadoop, MySQL for relational databases, AWS with DynamoDB, etc.)?
Workflow Handling and Management	Please outline how the Platform manages process workflow. E.g. Measurement and trending of alerts from remotely connected devices, visibility of metrics, workflow dashboards
Dashboards & Visualisation Tools	Are dashboards provided? Are real-time visualisation techniques available? How easy is to customize the tools?
Data Export and Reporting	In what formats data can be exported? Are there reporting solutions available? Is it possible to customized the reports based on the different type of users?
Enterprise Software Integration	Capability to integrate major backbone IT systems e.g. SAP, Oracle, Salesforce for CRM, Billing OS, ERP etc.
Cloud Solution Integration	Capability of integrating with different cloud solutions (AWS, Azure and etc.)
Data Type Management	What kind of data sources can be used (machine-generated data, databases, others)? What kind of data structures (structured, unstructured, time-series, data logs, text, etc)

4.4 Data Analytics

Please provide detailed descriptions on the functionality of the platform, these to include the following Evaluation Criteria as guidance but the responder is invited to include additional information on their Data Analytics services.

Evaluation Criteria	Response Prompts
Data Integration and Aggregation	Please, illustrate how data from different sources is aggregated and integrated in order to run analytics on the integrated set.
Descriptive Analytics	Are statistical descriptive techniques offered (mean, median , variance, correlation)?
Predictive Analytics/Forecasting Techniques	Which techniques are available for predictive analytics? Are time-series analysis available? What type of forecasting techniques are used?
Geo-fencing and location-based data	Are analytics available for location-based data? Do you have geo-fencing analytics? Are location-based heat-maps available? Others location-based services
Modelling and Automation	What types of data modelling does the platform offer? What level of data analytics automation are offered?
Machine Learning	Are machine learning techniques available (Neural networks)?
External Analytics Suite Integration	How easy is to integrate and use 3 rd party analytics suites?

4.5 Application Enablement & Development

Please provide detailed descriptions on the functionality of the platform, these to include the following Evaluation Criteria as guidance but the responder is invited to include additional information on their Application Development services.

Evaluation Criteria	Response Prompts
Application Development & Modelling	Do you provide an easy and usable way to create IoT applications? Is this a 'drag and drop' process? Are there pre-made widgets that can accept test data for visualisation purposes. Can you describe the platform development portal? What type of tools are provided for development, REST API, Angular JS? Other techniques
Application API management & Integration	Please outline the Platform's application integration/management capabilities. E.g. API services library, creation of device specific APIs, Enterprise interfaces.
Application Lifecycle Management – Hosting & Cloud Services	Please describe the hosting & cloud services capabilities and options available on the platform.
Application Lifecycle Management – Updating and Testing.	What testing capabilities are in place? Is there an agreement on new unit testing, overall system regression testing and performance testing? E.g. Performed at unit, component, function level? Test automation tools available?
Application Lifecycle Management – Archive and Revert	What archive solutions are offered?
Location Based application development tools	Please outline location based services enabled by the platform and relevant application tools (e.g. derived from GPS device, computed from IP address, map overlays).
Integration with External App Devel Tools	Does the platform allow integration with external application development tools?
Augmented Reality/Visualisation capability	Does the platform support AR/VR/modelling capabilities? Can a 'digital twin' of the device be created for visualisation purposes?
Documentation (Technical, Functional, Operational)	What technical, functional, operations, and development guidelines documentation are available?
Deployment Models	Can Platform be deployed on Cloud and On-Premise? (AWS/Azure etc). Is automatic deployment possible on the cloud?

Availability: - SLA Compliance Monitoring -Cluster Architecture - Planned Downtime	Does the platform provide the ability to determine whether invocations and responses are operating within predefined SLAs and to send alerts and and/or provide reports on compliance and violations as needed? Does the platform support full failover and load balanced only on-off failover? Where is data is stored? Is data synchronization needed? Does the platform have planned and agreed maintenance windows for product upgrades?
Microservices	Does the platform support the creation and use of Microservices

4.6 Generic Capabilities

Business Service Offerings	Are monetized services provided? For specific verticals?
Pricing Models	Please describe the pricing model and options available
Partnering/Ecosystem	Please describe your partner ecosystem and how you see that enhancing your services
IoT Vertical/Industry Strategy	Do you provide a selection of vertical industry templates to accelerate implementation of specific vertical industry solutions? If so, which industries? Examples would be Connected Spaces (Home/Buidling/City), Connected Transport (Fleet, Transit systems, Insurance)
Joint Go-to-market models	Are there existing GTM examples you can reference or describe possible GTM propositions achievable within the service offerings of your platform and/or in conjunction with your ecosystem partners.?
Differentiators	Are there any specific differentiators, business-related or of a technical nature, not covered above, that strongly differentiate your platform?

4.7 Security Provisions

The IoT platform must address 2 of adopters' basic requirements

4.7.1 Align with adopter's current IT infrastructure boundaries:

- Networks
- End-points, including IoT devices
- Users and applications

4.7.2 Align with adopter's current and evolving security strategy around the 5 security objectives:

- Prevent breach of IT infrastructure boundaries
- Detect threats in the IoT systems, through integration with SIEM platforms
- Respond and remediate incidents
- Continuously improve security posture through a holistic security strategy
- Comply with required audits and legislative reporting

<u>Functionality</u>	<u>Response Prompts</u>
Network / Security of connection & Security of transmission	<p>Describe the systems and processes in place to ensure security of transmission. Eg: what is the encryption to enable secure transmission (SSL/SSH/TSL) between networks (on-premise, public, private and hybrid clouds), endpoints, and users & applications</p> <p>Describe the systems and processes in place to ensure security of connection. Eg: Are you relying on the inherent security from standardised cellular connectivity such as those from 3GPP?</p>
End points	<p>How do you secure</p> <ul style="list-style-type: none"> • Access authorisation and authentication of IoT devices • Secure edge gateway management • Network access control (discovery, operation and management) • Encryption (KPI, digital signatures, SSH, SSL) • Rule-based access & audit trails
Users & Application	<p>How do you ensure secure:</p> <ul style="list-style-type: none"> • Identity access management • User/application based policy & audit trails • API security <ul style="list-style-type: none"> ○ Mobile application security ○ Patch management ○ Secure coding ○ OT application security
General functionality	<p>How does the platform support adopters' overall security objectives? Eg. How does the platform provide real time visibility and awareness of the IoT system to the adopters' overall security tools, controls and processes?</p> <ul style="list-style-type: none"> • Does your platform integrate into existing SIEM solutions? • How does your platform adhere to GDPR data protection • How does your platform adhere to GDPR privacy obligations,

	<p>especially on consent management over the lifecycle of data?</p> <ul style="list-style-type: none">• How does your platform ensure data security & privacy for data at rest and in transit?• Does your platform integrate into existing security framework for responding and remediating incidents involving breaches in IP-connected devices?• Does your platform integrate into adopter's security framework to rely on automation, analytics and AI-enhanced learning of baseline behaviour of network, endpoints, and users & applications?• Which IoT Security Framework(s) does your platform adhere to?• With which security specialist(s) are you currently working together on the network, end points, and users & applications side?
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5.0 Proposal Submission Guidelines

5.1 General Instructions.

- Expected responses to this RFP: One document OR more than one, e.g. Technical & Commercial.
- A non-disclosure agreement to be signed in relation to the contents of this RFP and the responses to it.
- References made to the “project” in this RFP refer to the deployment, testing and acceptance of the services provided, all related project management, training, and pre-launch activities
- When a reference is made to the “supplier” or “bidder” in this RFP, this refers to the vendor who is participating in this procedure through the submission of an offer for this project

5.2 Presentation of Responses

5.2.1 Technical Responses

- Service capabilities
- Service metrics

5.2.2 Commercial Responses

5.2.3 Project Plan to Implementation

6.0 Selection Criteria

6.1 Evaluation Process

6.1.1 Technical

<u>Criteria</u>	<u>Details</u>	<u>Assigned Weight</u>
Standard Features	Existing platform capabilities	xx %
Project Specific Features	Customised platform capability	xx%
QOS Offered	Commitments to service metrics e.g. platform availability, response times to LOS.	xx%
Compliances	IIC Test bed compliances IMC Validation	xx%

6.1.2 Financial

<u>Criteria</u>	<u>Details</u>	<u>Assigned Weight</u>
Basic Pricing – Platform Usage Pricing Options -	To be given in \$/€/£ etc	xx %
Provision of BOMs – Breakdown of costs to develop and test	For Development For Testing For Project Management Activities	xx%
	.	xx%
		xx%

7.0 General Terms and Conditions

7.1 Payments, Incentives and Penalties

7.2 Contractual Terms and Conditions

- Confidentiality
- Non-disclosure
- Right of rejection
- Cost of responses
- Public Statements
- Cancellation
- Law and Regulation
- Ownership

7.3 Process Schedule

- Decision date on responses
- Awarding of contracts
- Commencement of work
- Completion of development work
- Completion of compliance testing
- Completion of alpha testing (live)
- Completion of beta testing (controlled rollout)
- Full Service Launch

Addendum

Points of Contact for Future Correspondence.

References to IMC Validation process

Format guidelines for RFP responses