WHITE PAPER

Procuring Infrastructure-as-a-Service

- Sophie Jarvis

Abstract

The adoption of 'as-a-service' cloud computing is gathering momentum in both private and public sectors around the globe. The as-a-service model allows the consumer to move away from asset ownership and capital investment upfront (Capex) to pay-as-you-consume operational expenditure (Opex). Other benefits include and are not limited to: the ability to scale up and down services with demand real time; self-service provisioning; standardised costs and service levels providing greater transparency and certainty; no need to maintain, support and refresh hardware; ubiquitous network access for example via smartphones, tablets, desktops, laptops, etc., and support for disaster recovery, business continuity and high availability enablement in a multitenant environment.

One of the foundations for as-a-service cloud computing is the Infrastructure. We define Infrastructure as a service (IaaS) as a standardised, automated service, where compute, network and storage resources are owned and hosted by a vendor and offered to customers on-demand. Customers are able to self-provision these services, using a web-based graphical user interface that serves as an IT operations management console for the overall environment. Application Program Interface access (a set of routines, protocols, and tools for building software applications, etc.) access may also be offered as an option.

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Background

During a recent sourcing initiative for IaaS with a large client, whole of state government, Infosys Portland developed tender documents and bid-sheets in consultation with the client's internal Subject Matter Experts (SMEs).
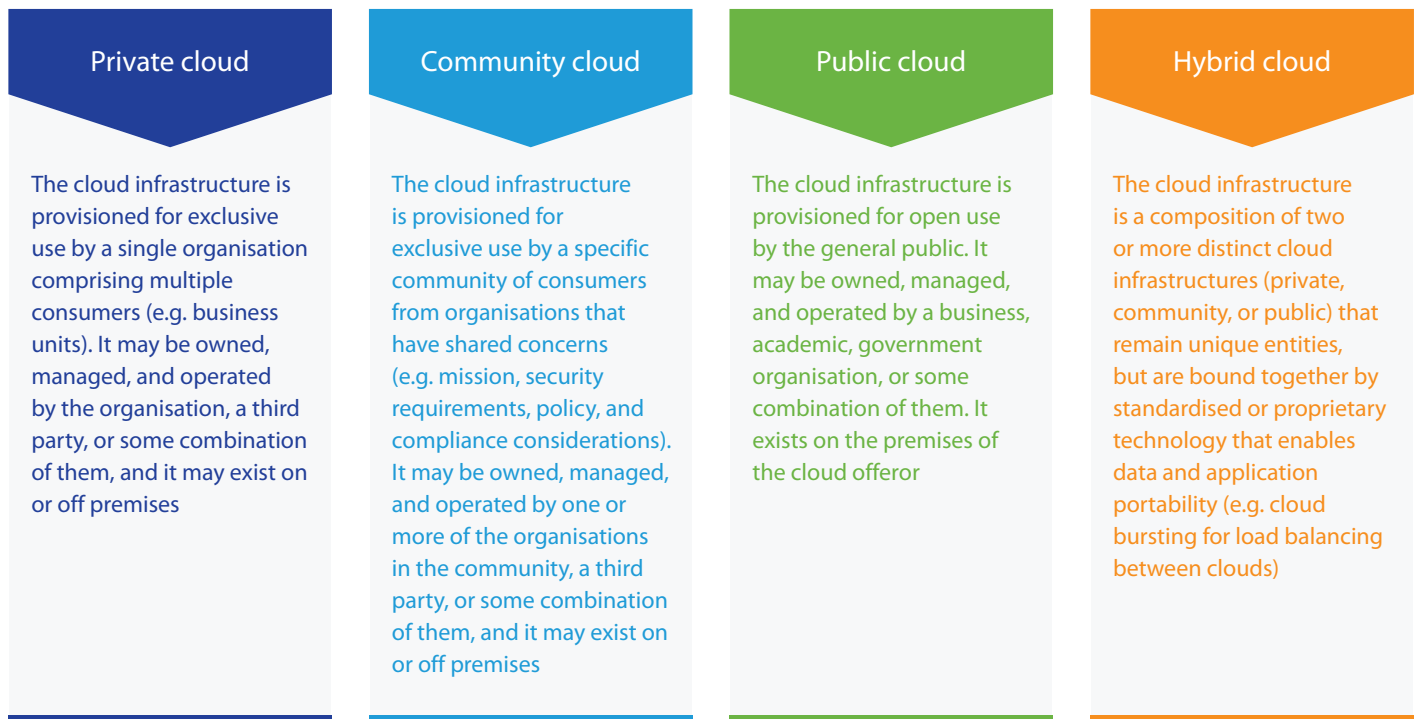
The tender documents that were developed in line with the specification requirements comprised of both mandatory and desirable requirements. Responses to mandatory requirements were verified through a pass/fail demonstration test, and only those respondents that passed the demonstration test were progressed further in the evaluation process.

In this White Paper, we will outline the importance of having a well-defined 'Spec'; including mandatory requirements and validation tests, and also look at desirable requirements that can be captured in the tender process.

Defining the 'spec' - IAAS deployment model

Defining the specification requirements is crucial as IaaS can be deployed in various ways, each of which could result in a different tender document and awarded supplier. At a high level, the main deployment models for IaaS fall into: Private, Community, Public and Hybrid cloud. The definitions of each, as per the National Institute of Standards and Technology[1], are below:

Private cloud	Community cloud	Public cloud	Hybrid cloud
The cloud infrastructure is provisioned for exclusive use by a single organisation comprising multiple consumers (e.g. business units). It may be owned, managed, and operated by the organisation, a third party, or some combination of them, and it may exist on or off premises	The cloud infrastructure is provisioned for exclusive use by a specific community of consumers from organisations that have shared concerns (e.g. mission, security requirements, policy, and compliance considerations). It may be owned, managed, and operated by one or more of the organisations in the community, a third party, or some combination of them, and it may exist on or off premises	The cloud infrastructure is provisioned for open use by the general public. It may be owned, managed, and operated by a business, academic, government organisation, or some combination of them. It exists on the premises of the cloud offeror	The cloud infrastructure is a composition of two or more distinct cloud infrastructures (private, community, or public) that remain unique entities, but are bound together by standardised or proprietary technology that enables data and application portability (e.g. cloud bursting for load balancing between clouds)

The deployment method that is required by the purchaser will help shape the mandatory requirements that allow suppliers to self-deselect and result in a more efficient tender evaluation process.

[1] http://csrc.nist.gov/publications/PubsSPs.html#800-145

Mandatory requirements and testing

Once the IaaS deployment model is confirmed, the bidsheets will need to be developed according to the model of IaaS that is required. Setting mandatory requirements allow IaaS offerors that do not offer the specific deployment model being sought to self-deselect from the tender process. The mandatory criteria should be scoped in consultation with the client and will provide another opportunity to ensure the spec is correctly defined and fit for purpose.

For each deployment model there are common characteristics which would be included as mandatory requirements in the tender document, as detailed below:

On-demand self-service	A consumer can unilaterally provision computing capabilities, such as server time and network storage, as needed automatically without requiring human interaction with each service offeror
Broad network access	Capabilities are available over the network and accessed through standard mechanisms that promote use by heterogeneous thin or thick client platforms (e.g. mobile phones, tablets, laptops, and workstations)
Resource pooling	The provider's computing resources are pooled to serve multiple consumers using a multi-tenant model, with different physical and virtual resources dynamically assigned and reassigned according to consumer demand. There is a sense of location independence in that the customer generally has no control or knowledge over the exact location of the provided resources but may be able to specify location at a higher level of abstraction (e.g. country, state, or data centre). Examples of resources include storage, processing, memory, and network bandwidth
Rapid elasticity	Capabilities can be elastically provisioned and released, in some cases automatically, to scale rapidly outward and inward commensurate with demand. To the consumer, the capabilities available for provisioning often appear to be unlimited and can be appropriated in any quantity at any time
Measured service	Cloud systems automatically control and optimise resource use by leveraging a metering capability at some level of abstraction appropriate to the type of service (e.g. storage, processing, bandwidth, and active user accounts). Resource usage can be monitored, controlled, and reported on

In addition to the above generic requirements for IaaS, more specific mandatory requirements can be included for the desired deployment model. Please refer to the case study below as an example of additional mandatory requirements that could be added to tender documents, specific to Public cloud.

Because the IaaS market is relatively immature and the supply market landscape is constantly evolving, it is important to verify all supplier responses to mandatory requirements. In our experience, we found that some suppliers were so eager to increase market share and establish themselves as IaaS market leaders that many responded "comply" with mandatory requirements and then provided an ambiguous caveat in a full response field. One effective way to verify responses to mandatory requirements is to have suppliers sit a demonstration test which will prove or disprove their ability to meet the scoped mandatory requirements. We found the demonstration test to be a crucial component of the tender evaluation process which fleshed out those suppliers who optimistically answered 'comply' to mandatory requirements, but in reality their technical capabilities were not yet up to speed and therefore those suppliers were not progressed further in the evaluation process.

Case study - Public cloud

During the recent sourcing initiative, the characteristics of Public cloud, additional to the generic characteristics of IaaS, were converted into mandatory requirements in the tender document to ensure only offerors capable of delivering IaaS in a public cloud would respond and be progressed in the tender process. Examples of additional mandatory requirements that were used to filter for only quality offerors of Public cloud are scoped below:

Additional requirement	The offeror must be able to supply services with no-minimum financial commitment or usage commitment for no fixed duration of service
Additional requirement	The services scoped in these mandatory requirements must be pre-existing services available to all customers

In line with the characteristics of Public Cloud, the above mandatory requirements remove the bespoke solution providers from responding to the tender. The Public cloud model is really a commoditised service and therefore no minimum commitment should be required as customers can opt in and opt out at any time, with no material effect on the supplier. A number of IaaS providers will build an ecosystem for a specific project or client and this will come at a significant upfront cost, which is not the type of supplier being sought for Public cloud.

In the recent sourcing initiative we tested all respondents' ability to provision services as scoped in the mandatory requirements. This was an interesting exercise that saw a number of offerors be eliminated from further evaluation as they were unable to demonstrate the provisioning of services that they had indicated they could provide in their tender response.

Desirable requirements

Further to the deployment model choice, the client may have preferences around datacentre location, security protocols and other technical capabilities. While these may not be mandatory requirements, more extensive details around service offerings can be captured in other desirable requirements, which may fall into the following categories:

1	Availability		7	Security
2	Compliance		8	Service Management
3	Configuration		9	Service Provisioning
4	Contract and Control		10	Sustainability
5	Technical		11	Transitioning
6	Innovation			

Defining the 'spec' - IAAS deployment model

1. Availability

Refers to the level of uptime of services and can involve asking what the target level is (except during standard maintenance windows), the ability to withstand disruptions and if they have a history of non-scheduled service downtime

2. Compliance

Compliance to industry and global standards, predominantly around the Data Centres. International standard ISO27001 could be made a mandatory requirement. Request copy of certificates to verify compliance

3. Configuration

Around customer remote management access and strong multi-factor authentication for management portal access

4. Contract and Control

Questions around business continuity plan and disaster recovery plans

5. Technical

All technical capability questions should be included in this category. A few examples include: does the offeror provide colocation, save images, automate recovery of Virtual Machines, support network load balancing, etc.

6. Innovation

Request information on product and service offering roadmaps, and any creative approaches to delivery of IaaS to clients

7. Security

This is going to be a very important category for most purchasers of IaaS. Security is mainly around protection and access to data, i.e. is data encrypted in transit/at rest, standard practice around management of encryption keys, location of data centres (country, city etc.), where will data be stored, segregation of duties, comprehensive access log/ firewall log, pen testing, supply chain process, third party contractors and access to data, deletion of client data post termination of contract

8. Service Management

Help desk support, incident report log process, monitoring systems and dashboards, reporting frequency and accuracy, end-user training, system upgrade informing and approval process

9. Service Provisioning

Time it takes to provision new services, support of provisioning and de-provisioning of services via online self-service portal, are services available on demand.

10. Sustainability

Request details of published sustainability policy

11. Transitioning

Requirements for commencement and closing down of services, disconnect process requirements, processes that are in place for on boarding and off boarding a customer's account

Conclusion

IaaS can be delivered via four different deployment models and it is important that the purchaser knows which model is fit for their purpose. Including mandatory requirements in the tender document will allow many offerors to self-deselect from the tender process thus avoiding costly bid response when they cannot meet minimum client selection criteria. Through a demonstration test the purchaser can validate the responses to mandatory requirements. Other desirable requirements can be captured and evaluated by the purchaser on various categories related to IaaS solutions and delivery. Beyond these starting points, the purchaser also needs to consider the quantitative (pricing and discounts) and Service Level Agreements. When all of these elements are captured in the tender process the purchaser will be well set up for a successful procurement of IaaS solutions.

About the Author

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Sophie has over 15 years' procurement services experience in industry and a further 6 years in Consultancy Advisory. Sophie is a highly regarded procurement professional, an expert in sourcing, category management and supplier relationship management across all ICT and business services categories across a range of client industries.

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