



PUBLICATION LAUNCH

Cloud Computing as a Key Enabler for Digital Government across Asia and the Pacific

Monday, 5 July 2021

Q & A Discussion

(lightly edited for clarity)

Note: the answers provided here do not represent the view of ADB, but were answered live or post event by our speakers.

QUESTIONS	ANSWERS
<p>1. If cloud computing will become the trend, will it kill or diminish the business/use of physical servers/data centers?</p>	<p>I assume you mean will it kill the on-prem deployment of physical servers, and private data centres? Personally, I don't think so! I've notice that in small test-bed deployments, there will be people who will still want to be playing about with their own servers (think about those people who are mining bitcoin and farming other plots.) Also, note that if you are training people on HOW to deploy servers, you will want them to play with your own server room first, NOT release them to the full data centre to learn there. Let them learn how to do networking on the on-prem racks first, then if they break it, the system is contained and they won't be able to accidentally break something they're not supposed to.</p>
<p>2. Can you enlighten us on cost and ROI of public vs private vs hybrid cloud?</p>	<p>Please refer to the following links to Cloud Calculators: https://cloud.google.com/products/calculator https://azure.microsoft.com/en-us/pricing/calculator/ https://calculator.aws/#/ https://www.oracle.com/cloud/cost-estimator.html https://www.ibm.com/cloud/cloud-calculator https://www.huaweicloud.com/intl/en-us/pricing/#/ecs https://cloud.netapp.com/google-cloud-calculator DC/hardware/laaS Calculators https://www.se.com/ww/en/work/solutions/system/s1/data-center-and-network-systems/trade-off-tools/data-center-capacity-and-growth-planning-calculator/ https://www.coresite.com/resources/colocation-calculator https://expedient.com/knowledgebase/tools-and-calculators/data-center-build-vs-buy-calculator/</p>
<p>3. Is it a step-by-step / phased process you will</p>	<p>Great question! I always recommend a phased approach, mainly because you will almost always be moving a "live"</p>

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<p>recommend (for the transition) from on-premise to private to hybrid then to public?</p>	<p>system -- you are probably already using a particular system, so you want to be very very careful not to mess up the current process.</p> <p>I strongly recommend (1) pilot a small project first, with "fake data" that mimics your current system, to see if the migration works, (2) do a limited-scale migration first on a TEST basis - do on a weekend (start on Friday after work) then test and see if it works, then work out the problems, (3) after working out the issues in (2), then plan to do full implementation, but MUST run the system IN PARALLEL to the current system for maybe 6 months (depends on what your IT experts say, also depends on your budget as you must budget for this redundancy).</p>
<p>4. To what extent are the services provided by different cloud service providers interoperable? Could governments take a multi-vendor approach?</p>	<p>It depends on the service, but generally, cloud computing is meant to enable interoperability. Different types of databases should have permissions enabled for different services (see the Korea EISS example for the information systems architecture https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7282422/) and an API approach towards government services build on cloud may be put in place (see Singapore's API Exchange APEX example https://www.developer.tech.gov.sg/technologies/data-and-apis/apex.html)</p> <p>Please also see this blog, published via Singapore's GovTech agency: https://www.tech.gov.sg/media/technews/why-running-cloud-services-matter-for-the-government reflecting on how multiple cloud service providers are best used.</p> <p><i>Answered live:</i> Speaking generally (and not considering contextual factors), Governments should take a multi-vendor approach despite the added complexity of procuring and managing multiple relationships.</p>
<p>5. What pathway do you recommend - private vs public vs hybrid?</p>	<p>It really depends on what the policy challenge is for which cloud is being used — but, in general, public cloud will provide the most cost-effective, secure, scalable solution. Hybrid solutions might be best for some parts of government where sensitive data is to remain on its own infrastructure. Although, even when using public cloud, the government still has full control over the data and its use.</p>

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<p>6. We can't have data center operated by global providers in all countries in Asia Pacific, what are your views for emerging markets like Cambodia, Laos, Vietnam, Philippines, etc.?</p>	<p>Why would one need data centers in each of these countries? Only if you are insisting on data localization "put the data in my country" policies — you'll see the first recommendation in the paper is NOT to have data localization policies.</p> <p>The concept and the power of cloud = borrow other people's stuff, like GrabTaxi/GoJek/Uber. You don't have a car, just rent from other people for a while to get to where you need go.</p> <p>There are important processes which you will need to put in place, like Standard Operating Processes, Standard Contractual Clauses, and Mutual Legal Assistance Treaties (MLATS) which you may want to look into.</p> <p>A key benefit of hyperscale (global) public cloud is that the infrastructure doesn't need to be physically present in every country — smaller countries can access cutting-edge technologies without requiring a domestic data center.</p>
<p>7. How can ASEAN leverage digital marketplaces for cloud services (e.g. GCloud in UK)?</p>	<p>This would be a bit difficult to implement. UK's GCloud is meant for one legal jurisdiction, the UK, and it is a marketplace for the UK government only. This would be a bit tricky for ASEAN to implement. I'd say look at international certification standards.</p>
<p>8. I completely agree with the direction of using a cloud system, but isn't it essential to use an appropriate cloud service that is unique to each country and not a multinational company? Isn't it necessary to figure out what personal information society (citizens) are receptive to storing on foreign Cloud Servers?</p>	<p>Having an appropriate cloud service is of vital importance. Ultimately, it would be up to the government to decide based on its needs and policy priorities, which are influenced by public opinion.</p>
<p>9. Mindanao is a predominantly Muslim region of the Philippines. With Islamic</p>	<p>I think this refers to broader Islamic Finance concerns but I would venture to say that a cloud-based system would be more able to calculate fees within set parameters, consistent with Shariah or another type of financial model (or any other).</p>

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<p>Finance being different from the finance practices in the rest of the country. (interest-based lending is not permissible for example). Were there any adjustments made in your work with the Philippine Central Bank, that accommodated this cultural difference?</p>	
<p>10. Has cloud computing been used in the judiciary? Can you provide an example.</p>	<p>Yes! Starting with basic information storage - many legal services are putting their databases onto cloud services so that their legislation is online, AND there is always an up-to-date case database that lawyers can get to, to build their cases. Data classification and tagging is slowing the process down, BUT it is definitely being used. On other use cases, have a look at the Singapore Legal Industry Technology and Innovation Roadmap 2030 (https://www.straitstimes.com/singapore/new-10-year-road-map-to-promote-technology-adoption-in-singapores-legal-industry and https://www.mlaw.gov.sg/files/news/press-releases/2020/10/MinLaw_Tech_and_innovation_Roadmap_Report.pdf)</p>
<p>11. Please share who currently has multi-cloud in APJ (as a good example)? How do they split the applications?</p>	<p>See how Singapore's GovStack handles multiple sources, technologies, and applications. Built on the principle of multi-tech (rather than just multi-cloud). Have a look at the API exchange (https://www.developer.tech.gov.sg/technologies/data-and-apis/apex.html) and how the Singapore Government has set up the Developer Portal for their staff – across various agencies. They have been equipped to build applications and other technologies for government agencies. https://www.developer.tech.gov.sg/</p> <p>This approach is not a centralized “we split up the applications amongst the agencies” (which is the assumption of the question), but rather turns the question on its head, and takes the approach, “how can we best enable government agencies to use and develop interoperable cloud applications that can interconnect with each other, AND also be safe and secure and adhering to government standards of cybersecurity, AND also</p>

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	ensure that we have some oversight over who is connecting to what?"
12. Any example for a regional organization to develop its cloud computing system to provide services for their members in Asia and the Pacific?	There are a number of community clouds which have been set up for rural banks by the rural bank cooperative in India - not quite regional, but close enough.
13. If Indonesia has put a moratorium on data centers does this apply to hyperscalers (e.g. AWS, Google) setting up local presence?	<i>(answered live)</i> The moratorium applies to Government Agencies (setting up their own data centers), not private sector service providers.
14. Building Data centers or cloud services to be hosted in local country to help solve latency could be an advantage rather than data privacy.	<i>(answered live)</i> Latency issues are minimal as this is in the millisecond range. This should not be a concern for users.
15. Is there is a source where we can read all the updated data classification policies?	No, there is no international agency who is keeping track, but here are some initial starting points: UK https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/715778/May-2018_Government-Security-Classifications-2.pdf Philippines – see Section 9 http://alagaw.dict.gov.ph/~s2goviph/policies/signed/department-circular-cloud-first-policy/ Australia https://www.protectivesecurity.gov.au/publications-library/policy-8-sensitive-and-classified-information
16. Would ADB share best practices on audit process of data flows back and forth when Public Cloud is used?	ADB is finalizing a <i>Cloud Audit Toolkit</i> for financial regulators with the Philippine Central Bank as its main audience. This knowledge product should be available later this year.

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<p>17. [Philippines] One of the critical costs that needs to be accounted for by government and private enterprises is Internet Connectivity. Which digital infrastructure component (i.e. last mile access, national backhaul, international capacity costs) is having the biggest impact on cost, especially since these are passed on to consumers?</p>	<p>Retail pricing of digital connectivity is indeed a cost factor. The greater the number of workloads that an institution shifts into the public cloud, the more it is dependent on internet traffic to be reasonably priced, of high quality and widely accessible.</p> <p>This can be a barrier to cloud adoption in parts of the Philippines where connectivity is not yet universally available and has varying quality of service. The National Broadband Plan envisages a Government Network that will address this in part (for internal use) but the full value of digital connectivity can only unfold its full value when citizens are able to avail eGovernment services with ease and in an affordable and equitable manner.</p> <p>The cost of mobile internet is low in the Philippines while high-speed cable or fiber access is costly when compared internationally with peer countries. Securing right-of-way is one of the key cost drivers.</p>
<p>18. [Cloud Computing] is a good idea, but how do you guarantee security?</p>	<p>There are many means by which to provide security assurances, and a key approach is through security standards and compliance checks. This is a risk management exercise, where you put in checks on security, e.g. "this is very sensitive data, we want to make sure that we check it every 3 months" – and therefore, you put in quarterly security check. For less sensitive data, perhaps you would like to check the security every 2 years. There is no one-size-fits-all approach towards security, which is why this is a risk management exercise: assess the risk of security breach, then put in security checks.</p> <p>Once you have decided on the frequency of security checks, you can then decide what kind of security checks you want – it would be useful to put in international standard checks, by the ISO/IEC for example, or other industry bodies who have specific checks for specific industries. The financial services sector has PCI DSS for example, the logistics sector has data interchange standards, and so have the medical sector – these are all methods by which we can work towards a strong risk management of security.</p>

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<p>19. I think the reason why a lot of governments have concerns about having data hosted outside the country is a misconception that the government of the data centre location or home country of the Cloud Service Providers (CSP), have access to the data and could compel the CSPs to give access.</p>	<p>Agreed. Our paper covers this topic and our discussion during this launch event has also emphasized this point.</p>
<p>20. As for financial inclusion, KYC and customer due diligence, is identified as a major bottleneck both from demand (convenience) and supply (compliance cost). Will cloud move the needle here? If so, how?</p>	<p>Cloud has moved the needle tremendously in the last 18 months, as COVID-19 measures have accelerated the modes and methods by which identity itself has been digitized and proper authenticated methods have been put in place. KYC and due diligence is a three-way street, there has to be (1) government-driven means by which citizens can identify themselves with a authenticated document format (such as an e-identity on a secure platform), (2) a way by which financial providers can verify themselves to be on this platform, and therefore can satisfy their own requirements for KYC and customer due diligence, and (3) possibly a third party such as an ombudsman needs to ensure that this process is not misused.</p> <p>Cloud computing has provided (1) a platform by which governments can build such platforms with authentication, (2) means and mechanisms and standards by which authentication can be verified, (3) interoperable systems by which, when set up well, will allow trace logs and data checks to disallow unauthorized access, and also allow verified parties to investigate any system abuses.</p>
<p>21. What is the role of the Internet Governance Forum (IGF) with regards to cloud</p>	<p>The IGF is a multi-stakeholder platform by which everyone can take part in the building of the information society. Many cloud providers do take part and support the IGF, and we encourage</p>

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computing and how does ADB work with IGF?	everyone to look into the multiple groups and discussions to participate. ADB has no formal partnership with the IGF.