Canadian Cloud Best Practices

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Canadian Cloud Computing - Platform for an Innovation Nation

As it is across the world, more and more CIOs in Canada are turning to the Cloud as their primary model for IT delivery.

For the purposes of our webinar series and best practices guide 'DigitalCanada.cloud', we define Canadian Cloud Computing to be the sum total of all the expertise and services Canadian CIOs need to implement Cloud solutions, meaning locally provided consulting services to access Cloud options delivered from outside of Canada, as well as within it.

In our guide we'll document the decision process you can follow to determine the best solution, through featuring inputs from local experts, showcasing Cloud Solution Blueprints, recipes for common IT requirements.

Canadian Cloud Data Privacy

However within this overall scope by far the most defining characteristic of Canadian Cloud is the data residency aspect. For many organizations especially those in regulated industries the blanket need to have data protected by local Canadian laws will be an overriding requirement, and so this will be a central feature of the guide.

Many software vendors seeking to personalize their products for the Canadian market have therefore deployed locally hosted offerings, such as Hubshare.

This highlights how global Cloud providers notably AWS and Microsoft Azure, have set up local Canadian data centres so that they can comply with the core requirement of Canadian data residency. Here is a video of IT World Canada interviewing AWS CTO Werner Vogels to discuss their launch in 2016.

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AWS launched a Canadian zone in 2016, signing a framework agreement with the government in 2019, with the details of their Protected B services described here. By December 2019 AWS were reporting a rapidly expanding footprint across the country, with key Canadian sectors like Oil & Gas adopting their services, as well as Government.

Major partners include VMware – Sean Forkan, Country Manager for VMware Canada discusses with Eric Gales, AWS Canada Director, how VMware Cloud on AWS is helping Canadian organizations to transform for future success.

Microsoft describes how their investment into Canadian Cloud will fuel innovation in Canada, announcing that it is undertaking the largest expansion of its Canadian-based cloud computing infrastructure since the launch of two Canadian cloud datacentre regions in 2016. As part of the announcement, Microsoft will be adding Azure Availability Zones in the Azure Canada Central region, increasing compute capacity by more than 1300% since the region was first brought online in 2016.

Keynote clients include the University Health Network, and the Canadian Government is also engaging with Microsoft for Cloud, also being certified for Protected B data hosting and signing a contract to adopt their Office 365 service. They have also made available a series of blueprints to help manage and monitor compliance obligations.

Cloud Solution Design

To the point of our guide it's not always the case that an AWS or Azure will be the best fit for your requirements.

There are many factors to consider even the basics of the vendor relationship you can hope for when working with a large global business versus a small, locally owned company, and for some workloads a more traditional managed or co-located service may be what you need. The Canadian Government has defined a 'Right Cloud' decision framework to guide this selection process.

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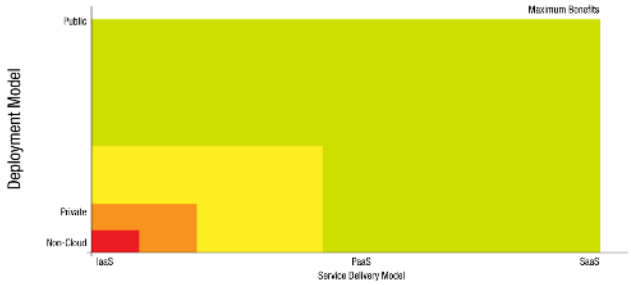

Furthermore the science of 'Canadian Data Privacy' has also evolved over the recent years to become a much more nuanced and sophisticated discussion, than simply a function of being hosted in Canada.

FuseForward provide this introductory overview of the topic and McMillan LLP this detailed walk through of the legal landscape. Cloud providers have made clear efforts to position their services as compliant with these requirements, such as AWS tailoring theirs even down to a level of Nova Scotian Healthcare data.

CBC reported on how this is an evolving landscape, with an increasingly accepted concept being recognized into Canada's new digital charter that users themselves should have control over their personal information, highlighting relevant innovations such as the 'Canadian Shield' from CIRA.

Being able to protect systems to enforce and safeguard these policies is a function of suitably capable Cybersecurity, and so hand in hand with Privacy legislation and practices we'll review associated best practices in this field, within a context of Building Canada's Cybersecurity Policy.

Accelerating Canadian Innovation

Most importantly is the role the Cloud will play in accelerating innovation in Canada. Kevin Carmichael writes for the Financial Post on the core ideal central to our initiative:

"Oil remains a pillar of Canada's economy, but it's the digital economy that's driving growth."

He reports on the challenges the nation faces transitioning from its historical resources economy to the new digital economy, citing examples such as Statistics Canada only collating retail spending from those businesses with a physical store, not the massive online trade with suppliers like Amazon.

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This is a pertinent example, as Statistics Canada are one of the agencies migrating to the Cloud, specifically for the purposes of modernizing how they work to embrace this transition.

They're adopting a Hybrid Cloud strategy, and *'believe working with private sector cloud specialists will bring numerous benefits, such as affordable access to new technologies, additional processing power, additional storage and more timely provision of data to researchers and the public'*.

As the first example of Statistics Canada highlights, the Canadian public sector is being empowered with a platform for accelerated digital innovation – Harnessing the Cloud will enable them to more rapidly develop and deploy new digital services that serve Canadians in new, faster and more efficient ways.

Importantly there are of course also local Canadian firms who offer data centre, Cloud hosting and application services. As adoption grows it will form a 'rising tide' effect that benefits all suppliers, greatly accelerating Canada's digital economy as they increase and improve the innovation-enabling services they offer.

It will even act as an accelerant in terms of attracting new businesses to Canada – For example UK-based iLand recently opened a Canadian data centre.

Thus across many dimensions Canada's digital economy will be forged upon and accelerated by Canadian Cloud computing.

Cloud Adoption Best Practices for Canadian Digital Government

The adoption of Cloud Computing is central to the Canadian Government's ambitions for a world class Digital Government.

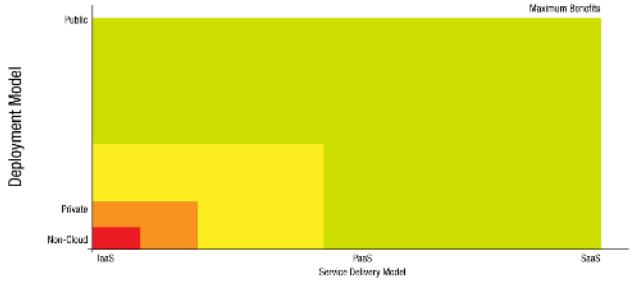
They publish their Cloud adoption strategy and best practices here, providing guidance on key topics such as Data Residency Requirements. Data Sovereignty, Security and Risk Management.

The Cloud Adoption Strategy proposes increasing levels of benefit in line with the scope of outsourcing.

What should be outsourced is regulated through the classification of data security, defining levels, Protected A, B and C, and from that enabling associated services – Early adopters include Shared Services Canada.

Government of Canada Right Cloud Selection Guidance

Given the diversity of the IT landscape, a one-cloud-fits-all solution will not serve all needs. The GC Right Cloud strategy enables CIOs to adopt the deployment model that best suits their business needs.



The GC Cloud Adoption Strategy puts forward a series of adoption principles for CIOs to consider when choosing and using services with the confidence that they will be maximizing the benefits of cloud, when cloud is appropriate, while ensuring the protection and privacy of Canadian's data. The onus is on the department to demonstrate which deployment model is right for their business context.

Cloud Adoption Best Practices for Canadian Digital Government

Nova Scotia – SaaS for Business Transformation

This promotional video from SAP SuccessFactors provides an excellent example of Government adoption of the SaaS deployment model, and how it has enabled Nova Scotia's digital transformation strategy.

Kevin Briand, Executive Director of Business Solutions, explains that the province is going through a significant digital transformation initiative.

The primary use case for this particular project is that Nova Scotia has eight school boards, each doing recruitment slightly differently. So the goal of implementing SuccessFactors is to rationalize these into a single, common approach.

This is part of the Shared Services initiative, intended to guide government's efforts to share services across departments, select Crown corporations and the health sector, intended to realize significant savings through this large scale efficiency.

Nova Scotia's move to the Cloud has been a measured one; their analysis identified that moving to Ariba would account for over half of the cost savings they would enjoy, in excess of $25-30 million.

Before their approach saw each individual hospital implement their own procurement practices, each buying for a different price. Standardizing on Ariba enabled them to build a single catalogue for the whole province of the best negotiated pricing. Nova Scotia has applied this consolidation and centralization across multiple procurement categories, such as AR, AP and materials management.

Cloud-Powered Digital Government: Developing a Digital Ready Public Service in Canada

Tens of thousands of active customers of all sizes, from the National Bank of Canada to Goodlife Fitness, use AWS to transform the way they do business.

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AWS for Public Sector

At their Ottawa Public Sector Summit AWS assembled an expert panel to explore the culture and skills challenges of this scale and depth of Cloud adoption for the Canadian Government.

AWS public policy experts debated the topic with Olivia Neal of the Treasury Board, who makes the keynote point that continual learning is the essential dynamic, achieved through new models and mindsets for public sector employment, like the Gig Economy, encouraging more fluid movement in and out of the sector rather than a single lifelong journey where the academic skills gained to begin that journey also mark the end of their education.

From 10m:00 Dr. Wendy Cukier provides a detailed synopsis of her research into the gender and diversity aspects of this challenge, including how 40% of public sector organizations don't consider themselves ready for digital transformation, and that there is a very low representation especially of younger women, highlighting the stunning fact that there are less women in Computer Science now than there was in 1989.

Cloud-Powered Digital Government: Developing a Digital Ready Public Service in Canada

Wendy also makes the critical point that it's not just tech skills that are holding back growth, identifying that for very advanced tech firms like AI companies, it's actually a lack of business personnel such as Sales and Marketing that is the issue.

From 17m:45 she then talks through an eight point set of recommendations, concluding that the headline strategy is not to view diversity and digital skills needs as a narrow HR function, but as a holistic embrace of modernization overall, transforming traditional work culture to one that is more fluid and flexible to attract younger talent, mirroring Olivia's point.

At their 2019 Ottawa Public Sector Summit Rejean Bourgault, who heads up AWS Canada's government team, leads a comprehensive walk through of AWS in Canada, their product portfolio and how it is being used to stimulate and enable innovative new digital services, including a case study from Economic Development Canada.

Ontario – Building 21st Century Government on the AWS Cloud

By using AWS, the Government of Ontario is able to make government information and services accessible to everyone. This video interview with Zeena Abdulla describes their journey to the Cloud.

The Government of Ontario, Canada's largest province with about 14 million people, looks after everything from healthcare and education to transportation and the environment. With the mandate to provide citizens with services clearly, quickly, and reliably, the Ontario Digital Services team turned to AWS to experiment with its website, Ontario.ca.

Cloud-Powered Digital Government: Developing a Digital Ready Public Service in Canada

By shifting the website to the AWS Cloud, the site stopped going down, they had a disaster recovery solution, and auto-scaling capabilities, all without requiring an expensive infrastructure purchase.

Zeena Abdulla describes how despite the size of the province, the Ontario Digital Service actually started very small with a limited budget, a constraint that led them to explore the use of AWS.

To begin with they knew very little about the service, and through trial and error they mastered the technology and this empowered their technology experts. Zeena says:

> "If you want to be a 21st century government, working in the open, sharing, working iteratively, experimenting are the key skills you need. This is the future, and a team that is really small and may not have the craziest skill sets can actually do pretty mighty things with the right tools, and that would be my message to other governments, to other public servants, just believe you can do great things."

The BC Developer Exchange - Building a Cloud-based Service Innovation Marketplace

This Red Hat case study describes how BC adopted Cloud technologies to tackle IT service delivery challenges, and furthermore build a local service innovation marketplace.

The province sought to improve its user experience, but its datacenter infrastructure was too slow and fragmented to offer the necessary speed and development capabilities. Basic web server access could take 3–4 months, resulting in a 4–6 month time frame just to launch a project.

To address this the province worked with Red Hat to deploy the OpenShift Container Platform, gaining in-depth infrastructure visibility and governance.

In addition, Red Hat Gluster Storage offers resilient data backup and persistent storage for containers, applications, PostgreSQL, Jenkins, messaging, logging, and metrics. Red Hat Fuse was deployed to manage API and data access and integrate legacy systems.

Open Source Innovation

Furthermore BC realized the full potential of this technology would be realized when they also employed an Open Innovation model, providing access to the platform not just to internal IT staff but to a local community of entrepreneurial businesses too.

The BC Developer Exchange - Building a Cloud-based Service Innovation Marketplace

The Developers' Exchange offers co-design sessions, meetups, and other outreach events to connect the province's private sector technology community with public sector needs. At these events, companies can learn about Code With Us, the procurement process that streamlines how the government works with developers and acquires software.

One example of success is a highway camera project for the Ministry of Transportation and Infrastructure. The department's online highway camera streams were used by news outlets and shared elsewhere. After creating an open API to offer information on accidents other road events, a local software firm used this API to develop a mobile app with additional features, such as location-based camera access.

A multidisciplinary, DevOps approach lets the province's nontechnical teams better participate in the creation of IT-based services.

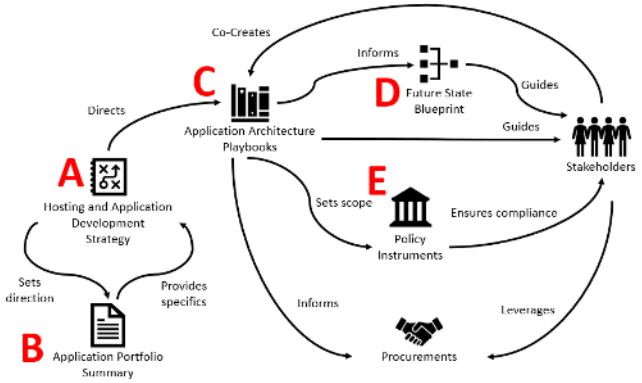
As a result, the province and private sector developers can work together more efficiently. For example, the Ministry of Transportation and Infrastructure rapidly developed a school bus inspection tracking service using Red Hat OpenShift Container Platform. Previously, the department had to wait 8-12 months just to receive proofs of concept, but this application was built and launched in just eight weeks.

British Columbia : Hosting and Application Development Framework

The Government of British Columbia is creating a Hosting and Application Development Framework (HADF) to accelerate digital change across government.

It is envisioned as a government-wide approach to modernize hosting and the ways that government develops and delivers applications for digital services, and has been modeled on best practices from around the world while aligning with government's current IT footprint.

The primary objective is to support their ongoing shift to Digital Government – HADF will support a shift in the digital delivery model over the next three years, during which time the current outsourcing of data centre and managed services will be up for renewal.



The main deliverables they are seeking from this engagement is a shared learning program, decision making framework and the development of Playbooks consisting of reference architectures, patterns, and other guidance instruments.

The strategy will inform the future direction of managed hosting and data centre services for government as well as application development and software services, such that it addresses:

- An improved OCIO service model for hosting. Ministries are seeking alternatives to the current model but are unsure of options and burdened with the current state.
- Clear policies and guidelines, enterprise-level agreements, predictable timelines and easy-to-access solutions.