AWS alignment with the Australian Signals Directorate (ASD) Cloud Computing Security Considerations

The Cloud Computing Security Considerations was created to assist agencies in performing a risk assessment of services offered by Cloud Service Providers. The following provides AWS alignment to the Security Considerations, published on September 2012. For additional details refer to:
http://www.asd.gov.au/publications/csocprotect/Cloud_Computing_Security_Considerations.pdf

Key Area	Questions	AWS INTERNAL RESPONSE
Maintaining Availability and Business Functionality	a. Business criticality of data or functionality. Am I moving business critical data or functionality to the cloud?	AWS customers retain control and ownership of their content. Customers are responsible for the classification and use of their content.
	b. Vendor's business continuity and disaster recovery plan. Can I thoroughly review a copy of the vendor's business continuity and disaster recovery plan that covers the availability and restoration of both my data and the vendor's services that I use? How much time does it take for my data and the services that I use to be recovered after a disaster, and do the vendor's other customers that are larger and pay more money than me get prioritization?	AWS customers retain control and ownership of their data. AWS provides customers the flexibility to place instances and store data within multiple geographic regions as well as across multiple Availability Zones within each region. Each Availability Zone is designed as an independent failure zone. In case of failure, automated processes move customer data traffic away from the affected area. AWS SOC 1 Type 2 report provides further details. ISO 27001 standard Annex A, domain 11. 2 provides additional details. AWS has been validated and certified by an independent auditor to confirm alignment with ISO 27001 certification. Customers utilize AWS to enable faster disaster recovery of their critical IT systems without incurring the infrastructure expense of a second physical site. The AWS cloud supports many popular disaster recovery (DR) architectures from "pilot light" environments that are ready to scale up at a moment's notice to "hot standby" environments that enable rapid failover. To learn more about Disaster Recovery on AWS visit http://media.amazonwebservices.com/AWS_Disaster_Recovery.pdf. AWS provides customers with the capability to implement a robust continuity plan, including the utilization of frequent server instance back-ups, data redundancy replication, and multi-region/availability zone deployment architectures. AWS provides customers the flexibility to place instances and store data within multiple geographic regions as well as across multiple Availability Zones within each region. Each Availability Zone is designed as an independent failure zone. In case of failure, automated processes move customer data traffic away from the affected area. AWS data centers incorporate physical protection against environmental risks. AWS's physical protection against environmental risks has been validated by an independent auditor and has been certified as being in alignment with ISO 27002 best practices. Refer to ISO 27001 standard, Annex A domain 9.1 and the AWS SOC 1 Type II report for additional information.

Key Area	Questions	AWS INTERNAL RESPONSE
	c. My data backup plan. Will I spend additional money to maintain an up to date backup copy of my data located either at my agency's premises, or stored with a second vendor that has no common points of failure with the first vendor?	AWS customers retain control and ownership of their content and it is the customer's responsibility to manage their data backup plans AWS allows customers to move data as needed on and off AWS storage. AWS Import/Export service for S3 accelerates moving large amounts of data into and out of AWS using portable storage devices for transport. AWS allows customers to perform their own backups to tapes using their own tape backup service provider. However, a tape backup is not a service provided by AWS. Amazon S3 service is designed to drive the likelihood of data loss to near zero percent and the durability equivalent of multi-site copies of data objects is achieved through data storage redundancy. For information on data durability and redundancy, please refer to the AWS web site. AWS offers a range of cloud computing services to support Disaster Recovery. To learn more about Disaster Recovery on AWS visit http://media.amazonwebservices.com/AWS_Disaster_Recovery.pdf.
	d. My business continuity and disaster recovery plan. Will I spend additional money to replicate my data or business functionality with a second vendor that uses a different data center and ideally has no common points of failure with the first vendor? This replication should preferably be configured to automatically "failover", so that if one vendor's services become unavailable, control is automatically and smoothly transitioned to the other vendor.	Customers retain control and ownership of their data. Customers can export their AMIs and use them on premise or at another provider (subject to software licensing restrictions). Refer to the AWS Overview of Security Processes Whitepaper for additional details - available at http://aws.amazon.com/security. AWS allows customers to move data as needed on and off AWS storage. AWS Import/Export service for S3 accelerates moving large amounts of data into and out of AWS using portable storage devices for transport. AWS allows customers to perform their own backups to tapes using their own tape backup service provider. However, a tape backup is not a service provided by AWS. AWS data centers are built in clusters in various global regions. All data centers are online and serving customers; no data center is "cold." In case of failure, automated processes move customer data traffic away from the affected area. Core applications are deployed in an N+1 configuration, so that in the event of a data center failure, there is sufficient capacity to enable traffic to be load-balanced to the remaining sites. AWS provides customers the flexibility to place instances and store data within multiple geographic regions as well as across multiple Availability Zones within each region. Each Availability Zone is designed as an independent failure zone. This means that Availability Zones are physically separated within a typical metropolitan region and are located in lower risk flood plains (specific flood zone categorization varies by Region). In addition to discrete uninterruptable power supply (UPS) and onsite backup generation facilities, they are each fed via different grids from independent utilities to further reduce single points of failure. Availability Zones are all redundantly connected to multiple tier-1 transit providers. Customers should architect their AWS usage to take advantage of multiple Regions and Availability Zones. Distributing applications across multiple Availability Zones provides the ability to remain resilient in the face of most failure modes including natural disasters or system failures. AWS SOC 1 Type 2 report provides further details. ISO 27001 standard Annex A, domain 11. 2 provides additional details. AWS has been validated and certified by an independent auditor to confirm alignment with ISO 27001 certification.

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	e. My network connectivity to the cloud. Is the network connectivity between my agency's users and the vendor's network adequate in terms of availability, traffic throughput (bandwidth), delays (latency) and packet loss?	Customers can also choose their network path to AWS facilities, including multiple VPN endpoints in each AWS Region. In addition, AWS Direct Connect makes it easy to establish a dedicated network connection from your premises to AWS. Using AWS Direct Connect, you can establish private connectivity between AWS and your datacenter, office, or colocation environment, which in many cases can reduce your network costs, increase bandwidth throughput, and provide a more consistent network experience than Internet-based connections. Refer to AWS Overview of Security Processes Whitepaper for additional details - available at http://aws.amazon.com/security.
	f. Vendor's guarantee of availability. Does the Service Level Agreement (SLA guarantee that the vendor will provide adequate system availability an quality of service, using their robust system architecture and business processes?	AWS does commit to high levels of availability in its service level agreements (SLAs). For example, Amazon EC2 commits to annual uptime percentage of at least 99.95% during the service year. Amazon S3 commits to monthly uptime percentage of at least 99.99% Service credits are provided in the case these availability metrics are not met. Customers should architect their AWS usage to take advantage of multiple Regions and Availability Zones. Distributing applications across multiple Availability Zones provides the ability to remain resilient in the face of most failure modes including natural disasters or system failures. AWS utilizes automated monitoring systems to provide a high level of service performance and availability. Proactive monitoring is available through a variety of online tools both for internal and external use. Systems within AWS are extensively instrumented to monitor key operational metrics. Alarms are configured to notify operations and management personnel when early warning thresholds are crossed on key operational metrics. An on-call schedule is used such that personnel are always available to respond to operational issues. This includes a pager system so alarms are quickly and reliably communicated to operations personnel. AWS Network Management is regularly reviewed by independent third party auditors as a part of AWS ongoing compliance with SOC, PCI DSS, ISO 27001 and FedRAMP.
	g. Impact of outages. Can I tolerate the maximum possible downtime of the SLA? Are the scheduled outage windows acceptable both in duration and time of day, or will scheduled outages interfere with my critical business processes?	AWS does not require systems to be brought offline to perform regular maintenance and system patching. AWS's own maintenance and system patching generally do not impact customers. Maintenance of instances themselves is controlled by the customer.
	h. SLA inclusion of scheduled outages. Does the SLA guaranteed availability percentage include scheduled outages?	AWS does not operate an environment with scheduled outage as AWS provides customers the ability to architect their environment to take advantage of multiple Availability Zones and regions.

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	i. SLA compensation. Does the SLA adequately reflect the actual damage caused by a breach of the SLA such as unscheduled downtime or data loss?	AWS provides customer remuneration for losses they may incur due to outages in alignment with AWS's Service Level Agreement.
	j. Data integrity and availability. How does the vendor implement mechanisms such as redundancy and offsite backups to prevent corruption or loss of my data, and guarantee both the integrity and the availability of my data?	AWS data integrity controls as described in AWS SOC 1 Type II report provides reasonable assurance that data integrity is maintained through all phases including transmission, storage and processing. In addition, refer to ISO 27001 standard, Annex A, domain 12.2 for further information. AWS has been validated and certified by an independent auditor to confirm alignment with ISO 27001 certification standard. Data centers are built in clusters in various global regions. AWS provides customers the flexibility to place instances and store data within multiple geographic regions as well as across multiple Availability Zones within each region. Customers should architect their AWS usage to take advantage of multiple Regions and Availability Zones. You choose where to store your data by specifying a region (for Amazon S3) or an availability zone within a region (for EBS). Data stored in Amazon EBS is redundantly stored in multiple physical locations as part of normal operation of those services and at no additional charge. However, Amazon EBS replication is stored within the same availability zone, not across multiple zones. Amazon S3 provides a highly durable storage infrastructure. Objects are redundantly stored on multiple devices across multiple facilities in an Amazon S3 Region. Once stored, Amazon S3 maintains the durability of objects by quickly detecting and repairing any lost redundancy. Amazon S3 also regularly verifies the integrity of data stored using checksums. If corruption is detected, it is repaired using redundant data. Data stored in S3 is designed to provide 99.999999999% durability and 99.99% availability of objects over a given year. Refer to AWS Overview of Security Processes whitepaper for additional details - available at http://aws.amazon.com/security
	k. Data restoration. If I accidentally delete a file, email or other data, how much time does it take for my data to be partially or fully restored from backup, and is the maximum acceptable time captured in the SLA?	AWS customers retain control and ownership of their data. AWS provides customers the flexibility to place instances and store data within multiple geographic regions as well as across multiple Availability Zones within each region.

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	l. Scalability. How much available spare computing resources does the vendor provide to enable my usage of the vendor's services to scale at short notice?	The AWS cloud is distributed, highly secure and resilient, giving customers large scaling potential. Customers may scale up or down, paying for only what they use.
	m. Changing vendor. If I want to move my data to my agency or to a different vendor, or if the vendor suddenly becomes bankrupt or otherwise quits the cloud business, how do I get access to my data in a vendor-neutral format to avoid vendor lock-in? How cooperative will the vendor be? How do I ensure that my data is permanently deleted from the vendor's storage media? For Platform as a Service, which standards does the vendor use that facilitate portability and interoperability to easily move my application to a different vendor or to my agency?	Customers retain control and ownership of their data. Customers can export their AMIs and use them on premise or at another provider (subject to software licensing restrictions). Refer to the AWS Overview of Security Processes Whitepaper for additional details - available at http://aws.amazon.com/security. AWS allows customers to move data as needed on and off AWS storage. AWS Import/Export service for S3 accelerates moving large amounts of data into and out of AWS using portable storage devices for transport. AWS allows customers to perform their own backups to tapes using their own tape backup service provider. However, a tape backup is not a service provided by AWS.

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Protecting Data from Unauthorized Access by a Third Party	a. Choice of cloud deployment model. Am I considering using a potentially less secure public cloud, a potentially more secure hybrid cloud or community cloud, or a potentially most secure private cloud?	AWS' Compliance and Security teams have established an information security framework and policies based on the Control Objectives for Information and related Technology (COBIT) framework. The AWS security framework integrates the ISO 27002 best practices and the PCI Data Security Standard. Refer to AWS Risk and Compliance Whitepaper for additional details - available at http://aws.amazon.com/security. AWS provides third party attestations, certifications, Service Organization Controls 1 (SOC 1) Type II report and other relevant compliance reports directly to our customers under NDA. Amazon Virtual Private Cloud (Amazon VPC) lets you provision a logically isolated section of the Amazon Web Services (AWS) Cloud where you can launch AWS resources in a virtual network that you define. You have complete control over your virtual networking environment, including selection of your own IP address range, creation of subnets, and configuration of route tables and network gateways. You can easily customize the network configuration for your Amazon VPC. For example, you can create a public-facing subnet for your webservers that has access to the Internet, and place your backend systems such as databases or application servers in a private-facing subnet with no Internet access. You can leverage multiple layers of security, including security groups and network access control lists, to help control access to Amazon EC2 instances in each subnet. Additionally, you can create a Hardware Virtual Private Network (VPN) connection between your corporate datacenter and your VPC and leverage the AWS cloud as an extension of your corporate datacenter
	b. Sensitivity of my data. Is my data to be stored or processed in the cloud classified, sensitive, private, or data that is publicly available such as information from my public web site? Does the aggregation of my data make it more sensitive than any individual piece of data? For example, the sensitivity may increase if storing a significant amount of data, or storing a variety of data that if compromised would facilitate identity theft. If there is a data compromise, could I demonstrate my due diligence to senior management, government officials and the public?	AWS customers retain control and ownership of their data and may implement a structured data-classification program to meet their requirements.

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	c. Legislative obligations. What obligations do I have to protect and manage my data under various legislation, for example the Privacy Act, the Archives Act, as well as other legislation specific to the type of data? Will the vendor contractually accept adhering to these obligations to help me ensure that the obligations are met to the satisfaction of the Australian Government?	AWS customers retain responsibility to ensure their usage of AWS is within compliance of applicable laws and regulations. AWS communicates its security and control environment to customers through industry certifications and third party attestations, white papers (available at http://aws.amazon.com/security) and providing certifications, reports and other relevant documentation directly to AWS customers. AWS has published a whitepaper on using AWS in the context of Australian privacy considerations, available at http://d0.awsstatic.com/whitepapersp/compliance/Using_AWS_in_the_context_of_Australian_Privacy_Considerations.pdf
	d. Countries with access to my data. In which countries is my data stored, backed up and processed? Which foreign countries does my data transit? In which countries is the failover or redundant data centers? Will the vendor notify me if the answers to these questions change?	AWS customers choose the AWS Region or regions in which their content and servers will be located. This allows customers with geographic specific requirements to establish environments in a location of their choice. AWS customers in Australia can choose to deploy their AWS services exclusively in the Asia Pacific (Sydney) region and store their content onshore in Australia. If the customer makes this choice, their content will be located in Australia unless the customer chooses to move the data. Customers can replicate and back up content in more than one region, but AWS does not move or replicate customer content outside of the customer's chosen region or regions. AWS is vigilant about customers' security and does not disclose or move data in response to a request from the Australian, U.S. or other government unless legally required to do so in order to comply with a legally valid and binding order, such as a subpoena or a court order, or as is otherwise required by applicable law. Non-U.S. governmental or regulatory bodies typically must use recognized international processes, such as Mutual Legal Assistance Treaties with the U.S. government, to obtain valid and binding orders. Additionally, our practice is to notify customers where practicable before disclosing their content so they can seek protection from disclosure, unless we are legally prevented from doing so.

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	e. Data encryption technologies. Are hash algorithms, encryption algorithms and key lengths deemed appropriate by the DSD ISM used to protect my data when it is in transit over a network, and stored on both the vendor's computers and on backup media? The ability to encrypt data while it is being processed by the vendor's computers is still an emerging technology and is an area of current research by industry and academia. Is the encryption deemed strong enough to protect my data for the duration of time that my data is sensitive?	AWS allows customers to use their own encryption mechanisms for nearly all the services, including S3, EBS, SimpleDB and EC2. VPC sessions are also encrypted. Amazon S3 also offers Server Side Encryption as an option for customers. Customers may also use third-party encryption technologies. Internally, AWS establishes and manages cryptographic keys for required cryptography employed within the AWS infrastructure. AWS produces, controls and distributes symmetric cryptographic keys using NIST approved key management technology and processes in the AWS information system. An AWS developed secure key and credential manager is used to create, protect and distribute symmetric keys and is used to secure and distribute: AWS credentials needed on hosts, RSA public/private keys and X.509 Certifications. AWS cryptographic processes are reviewed by independent third party auditors for our continued compliance with SOC, PCI DSS, ISO 27001 and FedRAMP. The AWS CloudHSM service allows you to protect your encryption keys within HSMs designed and validated to government standards for secure key management. You can securely generate, store, and manage the cryptographic keys used for data encryption such that they are accessible only by you. AWS CloudHSM helps you comply with strict key management requirements without sacrificing application performance. The AWS CloudHSM service works with Amazon Virtual Private Cloud (VPC). CloudHSMs are provisioned inside your VPC with an IP address that you specify, providing simple and private network connectivity to your Amazon Elastic Compute Cloud (EC2) instances. Placing CloudHSMs near your EC2 instances decreases network latency, which can improve application performance. AWS provides dedicated and exclusive access to CloudHSMs, isolated from other AWS customers. Available in multiple Regions and Availability Zones (AZs), AWS CloudHSM allows you to add secure and durable key storage to your Amazon EC2 applications
	f. Media sanitisation. What processes are used to sanitise the storage media storing my data at its end of life, and are the processes deemed appropriate by the DSD ISM?	When a storage device has reached the end of its useful life, AWS procedures include a decommissioning process that is designed to prevent customer data from being exposed to unauthorized individuals. AWS uses the techniques detailed in DoD 5220.22-M ("National Industrial Security Program Operating Manual ") or NIST 800-88 ("Guidelines for Media Sanitization") to destroy data as part of the decommissioning process. If a hardware device is unable to be decommissioned using these procedures, the device will be degaussed or physically destroyed in accordance with industry-standard practices. Refer to AWS Overview of Security Processes Whitepaper for additional details - available at http://aws.amazon.com/security.

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	g. Vendor's remote monitoring and management. Does the vendor monitor, administer or manage the computers that store or process my data? If yes, is this performed remotely from foreign countries or from Australia? Can the vendor provide patch compliance reports and other details about the security of workstations used to perform this work, and what controls prevent the vendor's employees from using untrustworthy personally owned laptops?	Moving IT infrastructure to AWS services creates a model of shared responsibility between the customer and AWS. This shared model can help relieve customer's operational burden as AWS operates, manages and controls the components from the host operating system and virtualization layer down to the physical security of the facilities in which the service operates. The customer assumes responsibility and management of the guest operating system (including updates and security patches), other associated application software as well as the configuration of the AWS provided security group firewall.
	h. My monitoring and management. Can I use my existing tools for integrity checking, compliance checking, security monitoring and network management, to obtain visibility of all my systems regardless of whether these systems are located locally or in the cloud? Do I have to learn to use additional tools provided by the vendor? Does the vendor even provide such a mechanism for me to perform monitoring?	AWS Cloudwatch provides monitoring for AWS cloud resources and the applications customers run on AWS. Refer to aws.amazon.com/cloudwatch for additional details. AWS also publishes our most up-to-the-minute information on service availability on the Service Health Dashboard. Refer to status.aws.amazon.com The AWS Trusted Advisor inspects your AWS environment and makes recommendations when opportunities exist to save money, improve system performance and reliability, or help close security gap.
	i. Data ownership. Do I retain legal ownership of my data, or does it belong to the vendor and may be considered an asset for sale by liquidators if the vendor declares bankruptcy?	AWS customers retain ownership and control of their data. AWS only uses each customer's content to provide the AWS services selected by each customer to that customer and does not use customer content for any secondary purposes. AWS treats all customer content the same and has no insight as to what type of content the customer chooses to store in AWS. AWS simply makes available the compute, storage, database and networking services selected by customer – AWS does not require access to customer content to provide its services

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	j. Gateway technologies. What technologies does the vendor use to create a secure gateway environment? Examples include firewalls, traffic flow filters, content filters, antivirus software and data diodes where appropriate.	The AWS network provides significant protection against traditional network security issues and customers can implement further protection. Refer to the AWS Overview of Security whitepaper (available at http://aws.amazon.com/security) for additional details. Amazon assets (e.g. laptops) are configured with anti-virus software that includes e-mail filtering and malware detection. AWS Network Firewall management and Amazon's anti-virus program are reviewed by independent third party auditors as a part of AWS ongoing compliance with SOC, PCI DSS, ISO 27001 and FedRAMP.
	k. Gateway certification. Is the vendor's gateway environment certified against government security standards and regulations?	AWS obtains certain industry certifications and independent third party attestations which include the AWS Gateway environment.
	l. Email content filtering. For email Software as a Service, does the vendor provide customizable email content filtering that can enforce my agency's email content policy?	A Customer can utilize a system to host e-mail capabilities, however in that case it is the Customer's responsibility to employ the appropriate levels of spam and malware protection at e-mail entry and exit points and update spam and malware definitions when new releases are made available.

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	m. Policies and processes supporting the vendor's IT security posture. Can I have details of how the vendor's computer and network security posture is supported by policies and processes including threat and risk assessments, ongoing vulnerability management, a change management process that incorporates security, penetration testing, logging and regular log analysis, use of security products endorsed by the Australian Government, and compliance with Australian government security standards and regulations?	Policies and procedures have been established by AWS Information Security based upon the COBIT framework, ISO 27001 standards and the PCI DSS requirements. AWS has been validated and certified by an independent auditor to confirm alignment with ISO 27001 certification standard. In addition AWS publishes a SOC 1 Type II report. Refer to the SOC 1 report for further details. The AWS Risk and Compliance whitepaper for additional details - available at http://aws.amazon.com/security. AWS customers are able to identify key controls managed by AWS. Key controls are critical to the customer's control environment and require an external attestation of the operating effectiveness of these key controls in order to comply with compliance requirements—such as the annual financial audit. For this purpose, AWS publishes a wide range of specific IT controls in its Service Organization Controls 1 (SOC 1) Type II report. The SOC 1 report, formerly the Statement on Auditing Standards (SAS) No. 70, Service Organizations report and commonly referred to as the Statement on Standards for Attestation Engagements No. 16 (SSAE 16) report, is a widely recognized auditing standard developed by the American Institute of Certified Public Accountants (AICPA). The SOC 1 audit is an in-depth audit of both the design and operating effectiveness of AWS' defined control objectives and control activities (which include control objectives and control activities over the part of the infrastructure AWS manages). "Type II" refers to the fact that each of the controls described in the report are not only evaluated for adequacy of design, but are also tested for operating effectiveness by the external auditor. Because of the independence and competence of AWS' external auditor, controls identified in the report should provide customers with a high level of confidence in AWS' control environment.
	n. Technologies supporting the vendor's IT security posture. Can I have details of how the vendor's computer and network security posture is supported by direct technical controls including timely application of security patches, regularly updated antivirus software, defense in depth mechanisms to protect against unknown vulnerabilities, hardened operating systems and software applications configured with the strongest possible security settings, intrusion detection and prevention systems, and data loss prevention mechanisms?	AWS provides third party attestations, certifications, Service Organization Controls 1 (SOC 1) Type II report and other relevant compliance reports directly to our customers under NDA. AWS Security regularly scans all Internet facing service endpoint IP addresses for vulnerabilities (these scans do not include customer instances). AWS Security notifies the appropriate parties to remediate any identified vulnerabilities. In addition, external vulnerability threat assessments are performed regularly by independent security firms. Findings and recommendations resulting from these assessments are categorized and delivered to AWS leadership. In addition, the AWS control environment is subject to regular internal and external risk assessments. AWS engages with external certifying bodies and independent auditors to review and test the AWS overall control environment.

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	o. Auditing the vendor's IT security posture. Can I audit the vendor' implementation of security measures, including performing scans and other penetration testing of the environment provided to me? If there is justifiable reason why auditing is not possible, which reputable third party has performed audits and other vulnerability assessments? What sort of internal audits does the vendor perform, and which compliance standards and other recommended practices from organization's such as the Cloud Security Alliance are used for these assessments? Can I thoroughly review a copy of recent resulting reports?	AWS provides third party attestations, certifications, Service Organization Controls 1 (SOC 1) Type II report and other relevant compliance reports directly to our customers under NDA. Customers can request permission to conduct scans of their cloud infrastructure as long as they are limited to the customer's instances and do not violate the AWS Acceptable Use Policy. Advance approval for these types of scans can be initiated by submitting a request via the AWS Vulnerability / Penetration Testing Request Form. AWS Security regularly engages independent security firms to perform external vulnerability threat assessments. The AWS SOC 1 Type 2 report provides additional details on the specific control activities executed by AWS.
	p. User authentication. What identity and access management systems does the vendor support for users to log in to use Software as a Service?	AWS Identity and Access Management (IAM) enables you to securely control access to AWS services and resources for your users. Using IAM, you can create and manage AWS users and groups and use permissions to allow and deny their access to AWS resources. AWS supports identity federation that makes it easier to manage users by maintaining their identities in a single place. AWS IAM includes support for the Security Assertion Markup Language (SAML) 2.0, an open standard used by many identity providers. This new feature enables federated single sign-on, or SSO, empowering users to log into the AWS Management Console or make programmatic calls to AWS APIs, by using assertions from a SAML-compliant identity provider, such as Shibboleth and Windows Active Directory Federation Services.
	q. Centralized control of data. What user training, policies and technical controls prevent my agency's users from using unapproved or insecure computing devices without a trusted operating environment to store or process sensitive data accessed using Software as a Service?	N/A

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	r. Vendor's physical security posture. Does the vendor use physical security products and devices that are endorsed by the Australian Government? How is the vendor's physical data center designed to prevent the tampering or theft of servers, infrastructure and the data stored thereon? Is the vendor's physical data center accredited by an authoritative third party?	The definition of AWS-defined logical and physical controls is documented in the SOC 1 Type II report (SSAE 16), and the report is available for review by audit and compliance teams. AWS ISO 27001 and other certifications are also available for auditors to review. Physical security controls include but are not limited to perimeter controls such as fencing, walls, security staff, video surveillance, intrusion detection systems and other electronic means. Physical access is strictly controlled both at the perimeter and at building ingress points and includes, but is not limited to, professional security staff utilizing video surveillance, intrusion detection systems, and other electronic means. Authorized staff must pass two-factor authentication a minimum of two times to access datacenter floors. Physical access points to server locations are recorded by closed circuit television camera (CCTV) as defined in the AWS Data Center Physical Security Policy. Images are retained for 90 days, unless limited to 30 days by legal or contractual obligations AWS provides data center physical access and information to approved employees and contractors who have a legitimate business need for such privileges. All visitors are required to present identification and are signed in and escorted by authorized staff. See the SOC 1 Type II report for specific controls related to physical access, datacenter access authorization, and other related controls. Refer to ISO 27001 standard, Annex A, domain 9.1 for further information. AWS has been validated and certified by an independent auditor to confirm alignment with ISO 27001 certification standard.
	s. Software and hardware procurement. What procurement process is used to ensure that cloud infrastructure software and hardware has been supplied by a legitimate source and has not been maliciously modified in transit?	In alignment with ISO 27001 standards, AWS Hardware assets are assigned an owner, tracked and monitored by the AWS personnel with AWS proprietary inventory management tools. AWS procurement and supply chain team maintain relationships with all AWS suppliers. Refer to ISO 27001 standard, Annex A, domain 7.1 for additional details. AWS has been validated and certified by an independent auditor to confirm alignment with ISO 27001 certification standard.

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Protecting Data from Unauthorized Access by the Vendor's Customers	a. Customer segregation. What assurance do I have that the virtualization and "multi-tenancy" mechanisms guarantee adequate logical and network segregation between multiple tenants, so that a malicious customer using the same physical computer as me cannot access my data?	Amazon EC2 currently utilizes a highly customized version of the Xen hypervisor. The hypervisor is regularly assessed for new and existing vulnerabilities and attack vectors by internal and external penetration teams, and is well suited for maintaining strong isolation between guest virtual machines. The AWS Xen hypervisor security is regularly evaluated by independent auditors during assessments and audits. All data stored by AWS on behalf of customers has strong tenant isolation security and control capabilities. Customers retain control and ownership of their data, thus it is their responsibility to choose to encrypt the data. AWS allows customers to use their own encryption mechanisms for nearly all the services, including S3, EBS and EC2. VPC sessions are also encrypted. Amazon S3 also offers Server Side Encryption as an option for customers. Refer to AWS Risk and Compliance Whitepaper for additional details - available at http://aws.amazon.com/security.
	b. Weakening my security posture. How would using the vendor's cloud infrastructure weaken my agency's existing network security posture? Would the vendor advertise me as one of their customers without my explicit consent, thereby assisting an adversary that is specifically targeting me?	AWS customers are considered confidential and would not advertise customer details without explicit consent. Amazon Virtual Private Cloud (Amazon VPC) lets you provision a logically isolated section of the Amazon Web Services (AWS) Cloud where you can launch AWS resources in a virtual network that you define. You have complete control over your virtual networking environment, including selection of your own IP address range, creation of subnets, and configuration of route tables and network gateways.
	c. Dedicated servers. Do I have some control over which physical computer runs my virtual machines? Can I pay extra to ensure that no other customer can use the same physical computer as me e.g. dedicated servers or virtual private cloud?	VPC allows customers to launch Amazon EC2 instances that are physically isolated at the host hardware level; they will run on single tenant hardware. A VPC can be created with 'dedicated' tenancy, in which case all instances launched into the VPC will utilize this feature. Alternatively, a VPC may be created with 'default' tenancy, but customers may specify 'dedicated' tenancy for particular instances launched into the VPC.
	d. Media sanitization. When I delete portions of my data, what processes are used to sanitize the storage media before it is made available to another customer, and are the processes deemed appropriate by the DSD ISM?	Customers retain ownership and control of their content and provide customers with the ability to delete their data. When a storage device has reached the end of its useful life, AWS procedures include a decommissioning process that is designed to prevent customer data from being exposed to unauthorized individuals. AWS uses the techniques detailed in DoD 5220.22-M ("National Industrial Security Program Operating Manual ") or NIST 800-88 ("Guidelines for Media Sanitization") to destroy data as part of the decommissioning process. If a hardware device is unable to be decommissioned using these procedures, the device will be degaussed or physically destroyed in accordance with industry-standard practices. Refer to AWS Overview of Security Processes Whitepaper for additional details - available at http://aws.amazon.com/security.

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Protecting Data from Unauthorized Access by Rogue Vendor Employees	a. Data encryption key management. Does the vendor know the password or key used to decrypt my data, or do I encrypt and decrypt the data on my computer so the vendor only ever has encrypted data?	AWS Customers manage their own encryption unless they are utilizing AWS server side encryption service. In this case, AWS does create a unique encryption key per tenant. Refer to AWS Overview of Security Processes Whitepaper for additional details - available at http://aws.amazon.com/security.
	b. Vetting of vendor's employees. What personnel employment checks and vetting processes does the vendor perform to ensure that employees are trustworthy?	AWS conducts criminal background checks, as permitted by applicable law, as part of pre-employment screening practices for employees commensurate with the employee's position and level of access to AWS facilities.
	c. Auditing vendor's employees. What robust identity and access management system do the vendor's employees use? What auditing process is used to log and review the actions performed by the vendor's employees?	In alignment with ISO 27001 standards, AWS has established formal policies, procedures to delineate the minimum standards for logical access to AWS resources. AWS SOC 1 Type 2 report outlines the controls in place to manage access provisioning to AWS resources. Refer to AWS Overview of Security Processes whitepaper for additional details - available at http://aws.amazon.com/security.
	d. Visitors to data center. Are visitors to data centers escorted at all times, and is the name and other personal details of every visitor verified and recorded?	All visitors and contractors are required to present identification and are signed in and continually escorted by authorized staff. AWS only provides datacenter access and information to employees and contractors who have a legitimate business need for such privileges. When an employee no longer has a business need for these privileges, his or her access is immediately revoked, even if they continue to be an employee of Amazon or Amazon Web Services. All physical access to datacenters by AWS employees is logged and audited routinely
	e. Physical tampering by vendor's employees. Is network cabling professionally installed to Australian standards or internationally acceptable standards, to help avoid the vendor's employees from accidentally connecting cables to the wrong computers, and to help readily highlight any deliberate attempts by the vendor's employees to tamper with the cabling?	Physical security controls include but are not limited to perimeter controls such as fencing, walls, security staff, video surveillance, intrusion detection systems and other electronic means. This includes appropriate protection for network cables. The AWS SOC 1 Type 2 report provides additional details on the specific control activities executed by AWS. Refer to ISO 27001 standard, Annex A, domain 9.1 for further information. AWS has been validated and certified by an independent auditor to confirm alignment with ISO 27001 certification standard.

Key Area	Questions	AWS INTERNAL RESPONSE
	f. Vendor's subcontractors. Do the answers to these questions apply equally to all of the vendor's subcontractors?	Provisioning contractor / vendor access is managed the same for both employees and contractors, with responsibility shared across Human Resources (HR), Corporate Operations and Service Owners. Vendors are subject to the same access requirements as employees.
Handling Security Incidents	a. Timely vendor support. Is the vendor readily contactable and responsive to requests for support, and is the maximum acceptable response time captured in the SLA or simply a marketing claim that the vendor will try their best? Is the support provided locally, or from a foreign country, or from several foreign countries using an approach that follows the sun? What mechanism does the vendor use to obtain a real-time understanding of the security posture of my use of the vendor's services so that the vendor can provide support?	AWS Support is a one-on-one, fast-response support channel that is staffed 24x7x365 with experienced and technical support engineers. The service helps customers of all sizes and technical abilities to successfully utilize the products and features provided by Amazon Web Services. All AWS Support tiers offer customers of AWS Infrastructure Services an unlimited number of support cases with pay-by-the-month pricing and no long-term contracts. The four tiers provide developers and businesses the flexibility to choose the support tiers that meet their specific needs.
	b. Vendor's incident response plan. Does the vendor have a security incident response plan that specifies how to detect and respond to security incidents, in a way that is similar to incident handling procedures detailed in the DSD ISM? Can I thoroughly review a copy?	The Amazon Incident Management team employs industry-standard diagnostic procedures to drive resolution during business-impacting events. Staff operators provide 24 x 7 x 365 coverage to detect incidents and to manage the impact and resolution. AWS's incident response program, plans and procedures have been developed in alignment with ISO 27001 standard. The AWS SOC 1 Type 2 report provides details on the specific control activities executed by AWS. The AWS Overview of Security Processes whitepaper (available at http://aws.amazon.com/security) provides additional details.
	c. Training of vendor's employees. What qualifications, certifications and regular information security awareness training do the vendor's employees require, to know how to use the vendor's systems in a secure manner and to identify potential security incidents?	In alignment with ISO 27001 standard, all AWS employees complete periodic Information Security training which requires an acknowledgement to complete. Compliance audits are periodically performed to validate that employees understand and follow the established policies. Refer to AWS Overview of Security Processes Whitepaper for additional details - available at http://aws.amazon.com/security.

Key Area	Questions	AWS INTERNAL RESPONSE
	d. Notification of security incidents. Will the vendor notify me via secure communications of security incidents that are more serious than an agreed threshold, especially in cases where the vendor might be liable? Will the vendor automatically notify law enforcement or other authorities, who may confiscate computing equipment used to store or process my data?	Notification of security incidents are handled on a case-by-case basis and as required by applicable law. Any notification is performed via secure communications
	e. Extent of vendor support. How much assistance will the vendor provide me with investigations if there is a security breach such as an unauthorized disclosure of my data, or if there is a need to perform legal electronic discovery of evidence?	AWS provides infrastructure and customers manage everything else, including the operating system, the network configuration and the installed applications. Customers are responsible for responding appropriately to legal procedures involving the identification, collection, processing, analysis and production of electronic documents they store or process using AWS. Upon request, AWS may work with customers who require AWS' assistance in legal proceedings.
	f. My access to logs. How do I obtain access to time synchronized audit logs and other logs to perform a forensic investigation, and how are the logs created and stored to be suitable evidence for a court of law?	Customers retain control of their own guest operating systems, software and applications and are responsible for developing logical monitoring of the conditions of these systems. In alignment with ISO 27001 standards, AWS information systems utilize internal system clocks synchronized via NTP (Network Time Protocol). AWS CloudTrail provides a simple solution to log user activity that helps alleviate the burden of running a complex logging system. Refer to aws.amazon.com/cloudtrail for additional details. AWS Cloudwatch provides monitoring for AWS cloud resources and the applications customers run on AWS. Refer to aws.amazon.com/cloudwatch for additional details. AWS also publishes our most up-to-the-minute information on service availability on the Service Health Dashboard. Refer to status.aws.amazon.com.
	g. Security incident compensation. How will the vendor adequately compensate me if the vendor's actions, faulty software or hardware contributed to a security breach?	AWS's incident response program, plans and procedures have been developed in alignment with ISO 27001 standard. The AWS SOC 1 Type 2 report provides details on the specific control activities executed by AWS. The AWS Overview of Security Processes whitepaper (available at http://aws.amazon.com/security) provides additional details.

Key Area	Questions	AWS INTERNAL RESPONSE
	h. Data spills. If data that I consider is too sensitive to be stored in the cloud is accidentally placed into the cloud, referred to as a data spill, how can the spilled data be deleted using forensic sanitization techniques? Is the relevant portion of physical storage media zeroed whenever data is deleted? If not, how long does it take for deleted data to be overwritten by customers as part of normal operation, noting that clouds typically have significant spare unused storage capacity? Can the spilled data be forensically deleted from the vendor's backup media? Where else is the spilled data stored, and can it be forensically deleted?	Customers retain ownership and control of their content. All data stored by AWS on behalf of customers has strong tenant isolation security and control capabilities. AWS allows customers to use their own encryption mechanisms for nearly all the services, including S3, EBS and EC2. IPSec tunnels to VPC are also encrypted. Amazon S3 also offers Server Side Encryption as an option for customers. Refer to AWS Risk and Compliance Whitepaper for additional details - available at http://aws.amazon.com/security. Refer to AWS Risk and Compliance Whitepaper for additional details - available at http://aws.amazon.com/security.