

RFT-1 DC Facilities

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1. General Requirements

- 1.1 The Australian Government is seeking data centre facilities to provide scalable and flexible arrangements to meet a wide range of requirements. Australian Government agencies (Agencies) require the provision of data centre facilities to enable them or their ICT services provider to operate the data centre Information and Communication Technology (ICT) infrastructure equipment. Data centre facilities are to be located within Australia.
- 1.2 For the purposes of this SoR, the following entities (Agencies) will be entitled to obtain, whether through Finance or directly, Data Centre Facilities under a Head Agreement:
- a) all agencies subject to the Financial Management and Accountability Act 1997 (Cth) (**FMA Agencies**);
 - b) all bodies subject to the Commonwealth Authorities and Companies Act 1997 (Cth) (**CAC Agencies**);
 - c) all other bodies governed by the Governor-General or a Minister of the Commonwealth or over which the Commonwealth exercises control (**Other Commonwealth Agencies**); and
 - d) all bodies governed by a State Governor or by a Minister of a State or Territory or over which a State or Territory exercises control (including departments in State or Territory Governments) (**State Agencies**).
- 1.3 For the purposes of this SoR, government data centre sites are defined as purpose built, permanent, shared enterprise facilities that can house the full range of ICT equipment currently used or that will be used by Agencies. The SoR is applicable to any space that provides electricity, cooling, fire suppression and/or security to data centre ICT such as servers, networks and data storage.
- 1.4 The Tenderer may offer data centre facilities that suit one or more of the following criteria:
- a) “**Ready now**”: a minimum of 500 m² (500 kW to 1 MW per 500 m²) of contiguous floor space is required which must be available for immediate occupancy;
 - b) “**Available later**”: a minimum of 500 m² (500 kW to 1 MW per 500 m²) of contiguous floor space that is currently occupied but will become available for occupancy during the life of the panel;
 - c) Under “**Fit-out**”: a minimum of 500 m² (500 kW to 1 MW per 500 m²) of contiguous floor space is required which must be available for occupancy by 30 June 2012; or
 - d) “**Green field**”: a minimum of 1000 m² (500 kW to 1 MW per 500 m²) of contiguous floor space is required, for which the Tenderer must meet the Conditions of Tender.
- 1.5 The Tenderer should note Section 9.4 of this document for a discussion on how the need for floor space expressed above may translate to power requirements in example scenarios.

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- 1.6 The Tenderer should provide a separate response for each criteria under which they are offering a particular data centre facility.
- 1.7 The data centre facilities should provide modularity, scalability and security to support multi-tier, multi-density and multi-tenancy requirements. It is desirable that the data centre facilities be divided as zones, modules or pods for use by different Agencies.
- 1.8 Agencies will require a diverse range of security requirements covering:
 - a) National Security classification from Restricted to Secret; and
 - b) Non-National Security classifications from In-Confidence to Highly Protected.
- 1.9 The term of any Contract will be 10 years with an option to extend for up to 5 years.

2. Terms Used in this Statement of Requirements

- 2.1 Currently there are no universally accepted classifications that can be applied to data centre facilities and services in Australia.
- 2.2 The Australian Government notes that there are multiple building standards governing data centre construction, including the Building Code of Australia, and various State and local government Acts and regulations. It is expected that all proposed data centre facilities have, or will have, received all relevant and necessary approvals.
- 2.3 As a basis for shared understanding, this SoR nominates the American Telecommunications Industry Associations standard TIA-942-2(April 2005, amended March 2010) as a means of describing data centre facilities. Tenderers should note that rigid compliance with TIA-942 is not sought, as it is incompatible with some Australian standards, and does not correctly describe all of the Agencies' requirements.
- 2.4 TIA-942 describes in its Annex G a model for data centre "Tiers". While this is for information and not part of the standard, Annex G of TIA-942 does assign the minimum standard of each requirement to a Tier rating.
- 2.5 The Tenderer will be requested later in this SoR to state an assessment of the proposed data centre facility's Tier rating for each section, and provide details that broadly satisfy the requirements, at the same time drawing attention to the areas of their non-compliance, and providing any reasons for non-compliance. Particular attention should be paid to sections concerning:
 - a) mechanical services;
 - b) electrical services;
 - c) Uninterruptible Power Supply (UPS) and battery provision;
 - d) fire prevention, detection and suppression;
 - e) CCTV and security provisions;
 - f) systems maintenance and testing arrangements; and
 - g) the Agencies' additional requirements specifically mentioned in this Statement of Requirements.

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- 2.6 For the purposes of replying to this tender, Tenderers will be asked to describe their data centre space as:
- a) **requiring a scheduled outage** of ICT equipment to perform maintenance on mechanical and electrical (M&E) equipment (Tier 1 and 2); and/or
 - b) **continuously maintainable** and not requiring scheduled outages of ICT equipment for any planned or unplanned maintenance to M&E (Tier 3 and 4).
- 2.7 The Australian Government also notes the technical guidance of the American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE) is also referenced widely. The ASHRAE guidance on achieving greater operational efficiency is of interest, but is not part of the formal requirements in this SoR.
- 2.8 Tenderers should note that the Agencies must comply with the Australian Government's security policies. These policies require data centre facilities to have particular capabilities, and have regular audits to demonstrate that the security policies continue to be met. The main policy document is the Australian Government Protective Security Policy Framework (PSPF). The PSPF supersedes the Protective Security Manual (PSM), and is publicly available from the Attorney-General's Department website (<http://www.ag.gov.au/pspf>). Note: Access to some areas of the PSPF is limited and available through the Attorney-General's Department on the basis of approved needs.
- 2.9 Tenderers should also note the second policy document affecting Agency use of ICT equipment, the *Information Security Manual*. This document is publicly available from <http://www.dsd.gov.au/library/infosec/ism.html>. This document also requires regular audits to meet security policy.

3. Data Centre Availability, Tier and Location

- 3.1 The Tenderer must provide the information requested below **separately for each data centre location offered**:
- a) type of offering (Ready now, Available later, Fit-out, or Green field, with separate responses for each type of offering where more than one type is available for the location);
 - b) address;
 - c) the Tenderer's tenure at the facility being offered;
 - d) the details of the data centre facility's owner if not the Tenderer; and
 - e) the expected working life of the offered facility as a data centre.
- 3.2 Tenderers must provide evidence of the following for **green field sites** offered:
- a) tenure to the land to be used;
 - b) evidence of an irrevocable right to develop the facility and for the site to operate as a data centre;
 - c) plans for the proposed facility; and

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- d) indicative dates when the facility will become operational.
- 3.3 The data centre facilities should ideally have different Tier levels to enable the Agencies to opt for Tier level(s) suitable for their operational needs. The Tenderer should specify if the data centre floor space being offered **requires a scheduled outage** for M&E maintenance or is **continuously maintainable**.

4. Data Centre Site Selection

- 4.1 The Tenderer should detail reasons for the data centre facilities site selection with regards to:
- a) geographic benefits with regard to proximity to water, power, telecommunications, transport, and workforce;
 - b) geographic risks including vulnerability to seismic activity, flood, (bush) fire, or any other environmental risk;
 - c) regulatory constraints, for example: air or noise pollution, or access to water; and
 - d) any other risk factors.
- 4.2 The Tenderer should provide a site risk assessment in their Response.
- 4.3 The Tenderer should provide information regarding the total computer room and plant room capacity within the data centre facilities including Gross Floor Area (GFA) and Nett Lettable Area (NLA).

5. Security

- 5.1 The Australian Government has mandatory security requirements that Tenderers must satisfy. See Sections 2.8 and 2.9.
- 5.2 Tenderers must state the level of physical security certification achieved for the data centre facility, including who performed the certification, the date issued, review periods and any plans to achieve a higher level of certification.
- 5.3 The Tenderer must meet facility security certification standards prior to acceptance of any Contract.
- 5.4 The Tenderer should identify how security certification is maintained between tenants, including those with significantly different security levels, for example, PROTECTED and SECRET.
- 5.5 The Tenderer should note that Agencies have their existing facilities audited by external and internal auditors as part of their accreditation processes, and this auditing process will be extended to include the Agency's data centre space within the data centre facilities.
- 5.6 The Tenderer would be required to co-operate with Agencies and their auditor during these accreditation processes.
- 5.7 The Tenderer's data centre facilities must have staff that have or are able to obtain appropriate security clearances up to and including SECRET and/or HIGHLY PROTECTED depending on Agency requirements.

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- 5.8 The Tenderer should identify the categories of clearances currently held by staff and mechanisms in place obtain clearances for new staff. Please do not provide the individual names and clearances of staff members.

6. Utilities

Power

- 6.1 The Tenderer should describe how power is provided to the site. Where multiple power connections are provided, the Tenderer should detail any factors that increase reliability of supply to the site, for example, power supplied to the site from different power grids.
- 6.2 The Tenderer should describe the current maximum power capacity delivered to the data centre facilities as a whole and how this could be increased (if needed).
- 6.3 The Tenderer should note that Agencies currently use single phase 240 volt 16 amp, 20 amp and 32 amp power in addition to 3 phase 240 volt and 415 volt power to racks and other equipment.
- 6.4 The Tenderer should indicate power delivery capabilities available at the data centre location offered.
- 6.5 The Tenderer should provide the name of the company providing power to the site and the names of any alternative suppliers.

Water

- 6.6 The Tenderer should describe:
- a) existing water supply to the site;
 - b) future expansion capacity to the site;
 - c) any reclamation or recycling of water on the site;
 - d) whether potable or non-potable water is used for cooling; and
 - e) Any regulatory constraint that may limit the use of mains supplied water for cooling.
- 6.7 Describe any contingency arrangements to enable continued operation if there is disruption to the main water supply.
- 6.8 State the maximum period of operation possible if there is disruption to the main water supply.

Telecommunications

- 6.9 The Australian Government strongly prefers that the data centre facilities have diverse routes and entries to provide for connection to multiple telecommunications carriers.
- 6.10 The Tenderer should describe the connectivity arrangements for telecommunications connection at the proposed data centre facilities.
- 6.11 The Tenderer should describe any redundancy of telecommunications connections to the site.

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- 6.12 The Tenderer should describe the number and name of communications carriers with connections to the site.
- 6.13 The Tenderer should describe the security management procedures for multiple carrier, access communications attachment points to the facility.
- 6.14 The Tenderer should provide and be responsible for the cost of multiple and diverse secured routes within the data centre facilities between and to each Agency's data centre facilities from building entry points.
- 6.15 The Tenderer should provide details of these secured diverse routes.

7. Facility Architecture

Building(s)

- 7.1 The Tenderer should describe the data centre building(s) by:
 - a) detailing the structure and design;
 - b) describing any sustainability elements of the design;
 - c) providing electronically scanned versions of the plans for the facilities in PDF format; and
 - d) providing actual photographs of the site showing an external view of the facility, the data hall, and the mechanical and electrical (M&E) facilities.
- 7.2 The Tenderer should note scanned floor plans should be supplied in PDF format and digital photographic images of the data centre facilities should be provided as digital photographs with sufficient resolution to render clearly the detail of the objects being photographed and should be supplied in JPEG format.
- 7.3 The Tenderer should explain its approach to minimise the effect of electromagnetic interference (EMI) upon Information and Communication Technology (ICT) equipment in the data hall.

Data Hall(s)

- 7.4 The Tenderer should state the size of each separate contiguous area of floor space being offered.
- 7.5 The Tenderer should provide an estimate of capacity likely to be available in future years based on current leases and planned expansion.
- 7.6 The Tenderer should state the data centre data hall design including:
 - a) computer room floor type (for example: raised, or solid);
 - b) design load bearing capacity per square metre or equivalent;
 - c) floor to ceiling height;
 - d) floor plenum height if used;
 - e) floor tile type and size if used; and
 - f) maximum rack height accommodated in rack units (RU).

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- 7.7 The Tenderer should describe the data hall layout and how multiple tenant ICT infrastructure is segregated.
- 7.8 The Tenderer should describe the suitability of the floor space being offered to accommodate non-rackable equipment requiring under floor cabling, cooling, power, and water, for example: mainframes, tape silos, and large printer systems.

Data Hall Surrounds

- 7.9 The Tenderer should describe the data centre facilities surrounding the data halls, including:
- a) door opening size of the data centre facilities;
 - b) the dimensions of the narrowest parts of the access path from the loading dock to the computer room;
 - c) corridor size;
 - d) turning space;
 - e) ramps; and
 - f) lifts, including:
 - i) maximum load capacity of the lift; and
 - ii) dimensions of the lift car / platform and doors.
- 7.10 The Tenderer should state if there is no lift access or if lift access is not required.
- 7.11 Each Agency may require a separate office space or run-up space, outside the computer room. If required, this office space will be an area controlled by an Electronic Access Control System (EACS) and is to be within the data centre facilities but partitioned from the computer room to provide a normal working and test/run-up area. That is, with suitable noise reduction and office grade air-conditioning arrangements.
- 7.12 The Tenderer should indicate whether run-up space for tenants is available and describe:
- a) the size available;
 - b) power capacity;
 - c) cooling capacity;
 - d) network connectivity;
 - e) any other network connectivity available from the run-up space, for example: internet, building management system and general building network;
 - f) phone connectivity capacities available for run-up space; and
 - g) whether the run-up space has a section of high floor loading space within the area that would be capable of supporting class B security containers weighing (approximately 200kg/m²).

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- 7.13 A secure storage space is required for each Agency's exclusive use to store its equipment, and disaster recovery materials, and accessories not installed in the data centre facilities. This space will be used for storage of computer media (including tapes, disks and other magnetic media, smart cards and similar devices) and paper documents. The storage space should provide fire protection adequate to withstand a temperature of 1000 C for at least one hour and an internal temperature of 30 C after exposure to high temperature for one hour.
- 7.14 The Tenderer should provide details of any storage space available.
- 7.15 The Tenderer should detail any temporary space available for equipment staging prior to installation in the data hall. This space should be air conditioned to allow ICT equipment to be acclimatised before installation.
- 7.16 The Tenderer should describe disposal mechanisms and responsibility for the removal of equipment packaging delivered to the site for installation.
- 7.17 The Tenderer should describe any additional facilities that are available for Agency staff and contractors such as kitchenette, rest areas, or ad-hoc meeting rooms.
- 7.18 An Agency may need to install a dedicated telephone link to their premises. The Tenderer should describe how these requirements may be met.

Perimeter

- 7.19 The Tenderer should provide physical security of the data centre facilities perimeter in accordance with the Secure Area requirements as described in the Australian Government Protective Security Manual (PSM).
- 7.20 Tenderers should describe the sort of perimeter protection for the data centre, for example: direct street access, fence or barrier protection.

Parking

- 7.21 The Tenderer should describe available parking facilities indicating capacity, security, surveillance, and weather protection, if applicable.

Loading Dock

- 7.22 The data centre facilities should have secure under cover loading and unloading facilities with direct access to Agency data centre space that allows equipment to be loaded and unloaded quickly and securely by Agency staff and contractors.
- 7.23 The Tenderer should provide details of loading dock size, materials handling equipment that is available on site (forklift, pallets jacks, server lifters, etc) and the largest vehicle size that could be accommodated.
- 7.24 The Tenderer should describe the undercover area available to temporarily store ICT equipment deliveries before they are transferred to the data hall.

Building Management System

- 7.25 The data centre facilities should have a comprehensive Building Management System (BMS) to monitor all security and environmental services with remote access capability. While such a system is necessary to achieve high levels of

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operational efficiency, this creates risks to tenant security. Tenderers must note that Agencies will seek to identify and manage these risks prior to the commencement of a tenancy. Tenderers should describe any risk assessments that have been conducted for the BMS.

- 7.26 The Building Management System should manage, monitor and integrate various components including, but not limited to, heating, ventilation and air conditioning (HVAC) systems, access control systems and fire detection systems. The Tenderer should describe the following general functions of the BMS:
- a) building management and control, including:
 - i) access control;
 - ii) perimeter security;
 - iii) power systems;
 - iv) HVAC systems;
 - v) water systems; and
 - vi) fire detection and suppression systems;
 - b) data collection and archival;
 - c) alarm event management;
 - d) trending;
 - e) reporting; and
 - f) maintenance management.
- 7.27 The Tenderer should indicate the granularity of monitoring and response capabilities of the BMS utilised including:
- a) the type of alerting mechanisms supported;
 - b) describe any mechanisms to confirm receipt of alerts; and
 - c) whether Agency tenants have remote access to the BMS.
- 7.28 The Tenderer should indicate if they have any current certifications for the BMS and the ability and willingness to obtain such requirements.

Secure Access Control

- 7.29 The access control system should be deployed with the objective of allowing entry to and exit from the data centre facilities to authorised personnel only, without the need of a paper sign-in process. For highly sensitive areas the system should be based upon proximity as well as incorporating biometric technology and proximity technology. The Agency may require electronic copies of the log data relating to all access activity to the Agency space.
- 7.30 The Tenderer should describe their access control system(s) and operating procedures for the data centre location offered.
- 7.31 The Tenderer should describe how a tenant's equipment is segregated and secured from other tenants' equipment.

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- 7.32 The Tenderer should describe how they manage and monitor access to the tenants ICT equipment and prevent inappropriate access by other tenants.
- 7.33 The Tenderer should describe how enclaves of ICT with a higher security requirement would be accommodated in a multi-tenant facility.
- 7.34 The security entry process for visitors should be a suitable sign-in process where Agency authorised staff and contractors are responsible for and accompany visitors at all times.
- 7.35 The Tenderer should identify the visitor access control system stating any limits on number of Agency staff to be authorised with access and notification for access lead time.

CCTV

- 7.36 The Tenderer should provide high quality digital recorded Close Circuit Television (CCTV) surveillance of data centre facilities doors and any space occupied by the Agencies. The system should, record accurate time and date stamps, have fast search functions, and be capable of providing alarm notification to offsite devices including phone and email. The video surveillance footage should be held onsite for immediate viewing for at least six months and the video surveillance footage should be made available for the Agency to duplicate and remove off-site if required for any security-related purpose. The Agencies may choose to take regular copies of the video surveillance footage and set up a long term archiving arrangement within their own backup regime.
- 7.37 The Tenderer should describe their CCTV infrastructure and how the above requirements can be met.
- 7.38 The Tenderer should describe any redundancy and single points of failure with the installed CCTV or monitoring system(s).
- 7.39 Agencies may wish to provide their own monitoring system within the data centre facilities for physical security and equipment monitoring. This would be in addition to any monitoring provided by the Tenderer. The Tenderer should describe how this could be achieved.
- 7.40 The Tenderer should detail security and access plans for emergency situations including fire, security incident, emergency evacuation, etc.

Data Hall Monitoring

- 7.41 The Tenderer must describe how they are able to report on and invoice the power consumed (see Pricing Model). The Tenderer must describe information that the Tenderer can provide to allow the invoiced power costs to be allocated between multiple tenants. The power consumption will need to be included in the account management reporting process.
- 7.42 The Tenderer should describe the following information:
 - a) what range of cooling temperatures can be provided;
 - b) can different zones be supplied with different cooling temperatures;
 - and

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- c) can the upgraded ASHRAE standards be applied, for example, higher cool-air supply temperatures up to 25°C?
- 7.43 The Tenderer should describe the granularity of data hall temperature management, for example: room, zone or rack.
- 7.44 The Tenderer should provide details of its ability to monitor, measure and report to Agencies (Metering System) the power consumed in data centre facilities in kilowatt hours per square metre per annum (kWh/m²/annum) including:
- a) power consumed at the rack or unit level;
 - b) power supplied to the racks and systems at the rack or unit level;
 - c) lighting in the data centre facilities; and
 - d) HVAC power consumed in the data centre facilities, both in total and the proportion allocated to the Agency.
- 7.45 The Tenderer should describe any mechanisms available to monitor and report on the quality of power:
- a) across A and B power distribution paths;
 - b) across three power phases; and
 - c) control available throughout the power distribution path.
- 7.46 The Tenderer should specify:
- a) who can manage it; and
 - b) whether remote monitoring or management is available.
- 7.47 The Tenderer should describe the remote access, if any, that Agencies may have to the Metering System.

Abnormal Event Monitoring and Management

- 7.48 Fire detection should be by means of automatic heat and smoke detectors located throughout the data centre facilities (including: ceiling, false floor and other appropriate areas where fires may occur) with appropriate manual activation (for example: break glass units, emergency button) on escape routes and exits.
- 7.49 The Tenderer should specify the fire protection, detection and suppression technology utilised including:
- a) fire suppression type;
 - b) period required for safe entry by Agency staff or contractors if the fire suppression system is discharged;
 - c) post discharge re-charging times;
 - d) whether fire suppression mechanisms cause any environmental consequences, for example, ozone depletion that may lead to regulatory changes in the future; and
 - e) the impact of fire suppression mechanisms used on ICT equipment, for example, particulate contamination or short circuit.

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- 7.50 Where required, detection for hazardous gases should be in place. The Tenderer should describe any monitoring and alerting capability for hazardous gases.
- 7.51 Alarm events should be triggered when seepage or leakage of water into the data centre facilities is detected. The Tenderer should specify the water seepage or leak detection system utilised.
- 7.52 The Tenderer should state if an emergency power off system is installed and the systems that may trigger its operation.

8. Mechanical and Electrical Distribution and Redundancy

- 8.1 The Tenderer should indicate the current and projected Power Usage Effectiveness (PUE) rating for the facility.
- 8.2 For sites requiring an outage for maintenance, the Tenderer should describe the frequency and duration ICT equipment would need to be shut down annually.
- 8.3 The Tenderer should describe if mechanical and electrical (M&E) maintenance can be performed without the need for maintenance staff to enter the tenant's space.
- 8.4 The Tenderer should describe the frequency and duration of any activity that may require a disruption to Agency ICT operations.

Power Distribution

- 8.5 The Tenderer is to describe the design of all power distribution paths in the facility including:
 - a) the level of power distribution redundancy and the degree of separation; and
 - b) if multiple power connections are available to the facility, whether power is using an active/active or active/passive implementation.
- 8.6 The Tenderer should describe the expected power losses from the main power distribution boards to a rack in the data centre facility.
- 8.7 Agencies may seek to use specific power cabling contractors to connect the distribution boards to the racks. The Tenderer should provide details of how Agency nominated contractors could work in the facility.
- 8.8 The Tenderer should describe any site standards or constraints for power distribution work performed by Agency contractors.

Backup-Up Power Generation

- 8.9 The Tenderer are to describe the design of on-site back-up power generation including:
 - a) type and capacity of generating equipment;
 - b) fuel capacity kept on-site;
 - c) the maximum rated running time for on-site generators;
 - d) if re-fuelling of generators during operation is possible; and

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- e) details of any arrangements in place for prioritised fuel deliveries during an extended grid power outage.
- 8.10 The Tenderer should identify if any co-generation or tri-generation capacity exists at the facility.
- 8.11 The Tenderer should indicate any power provided to the site from renewable sources.
- 8.12 The Tenderer should indicate any single points of failure in the power distribution path(s) between the power grid and on-site power generation, for example, when switching between back-up and grid supplied power.
- 8.13 Where locally generated power is the main source of energy to run the facility, the Tenderer should describe how access to the public power grid can be utilised as a back-up power source.

UPS

- 8.14 The Tenderer should describe the design, capacity and use of Uninterruptable Power Supply(s) (UPS) used to supply the data centre facilities including the maximum period of supply of power to ICT equipment and the degree of redundancy implemented.
- 8.15 The Tenderer should indicate equipment supported by the UPS equipment including:
 - a) data hall ICT equipment;
 - b) monitoring and alerting systems;
 - c) mechanical and electrical equipment;
 - d) facility lighting and telephone systems;
 - e) any infrastructure to alert ICT equipment to perform an orderly shut-down if UPS power is about to be exhausted; and
 - f) if batteries are used, does the UPS need to be taken off line for battery maintenance?
- 8.16 The Tenderer should provide evidence of green initiatives in UPS design that demonstrates the use of non-chemical based UPS systems and the reduction in the use of harmful chemicals in the UPS.

Cooling

- 8.17 The Tenderer should describe the cooling technology used in the data centre facilities, including how temperature and humidity are maintained and the operating ranges for temperature and humidity in the proposed facility.
- 8.18 The Tenderer should indicate the degree of redundancy in the cooling infrastructure.
- 8.19 The Tenderer should state how it will maintain continuous cooling and relative humidity to an Agency's equipment.
- 8.20 The Tenderer should state the cooling capacity in kilowatts (kW) and the coefficient of performance in their response for each of the various Tier levels they provide.

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- 8.21 The Tenderer should describe any aspects of the cooling solution that make it energy efficient and describe any ‘free air’ cooling used for the data centre facilities.
- 8.22 The Tenderer should describe any equipment on site used to reduce cooling costs such as air economisers or the use of ‘free air’ for data hall cooling.
- 8.23 For sites requiring an outage for maintenance, the Tenderer should indicate the frequency and duration for ICT equipment to be shut down each year.
- 8.24 The Tenderer should describe the granularity of air-flow monitoring implemented in the data hall.
- 8.25 The Tenderer should identify if Computational Fluid Dynamics (CFD) modelling is available at the site.
- 8.26 The Tenderer should identify any water reserves that are available at the site and expected maximum running time at the site if mains water supply is interrupted.
- 8.27 Developments in ICT cooling technology indicate the use of chilled water cooling within ICT equipment. The Tenderer should describe if it is possible to make the facilities chilled water supply available to individual rows or racks.

Sustainability

- 8.28 The Australian Government encourages “Green IT” and other environmental initiatives where possible, such as the reduction of greenhouse gas emissions, use of fossil fuel energy, use of water and e-waste.
- 8.29 The Tenderer should provide details of any Green Power (from renewable sources) used in data centre facilities.
- 8.30 The Tenderer should be certified to Environmental Management Systems (EMS) ISO14001 or to an equivalent environmental management standard, such as the Eco-Management and Audit Scheme (EMAS). If the Tenderer is not certified, the Tenderer should commit to be certified within 12 months of joining the panel of data centre Providers.
- 8.31 The Tenderer should provide the current greenhouse gas emission baseline for data centre facilities and plans, if any, for upgrades to infrastructure to reduce the greenhouse gas footprint.
- 8.32 It is desirable that the data centre operation minimises the use of water and power. The Tenderer should detail how this can be achieved.

9. Data Hall Fitout

Power / Cooling and Rack Layout

- 9.1 The Tenderer should describe the design and any constraints to Agency tenants on rack design and implementation.
- 9.2 The Tenderer should describe any data hall rack conventions that are implemented at the site including:
 - a) if the data hall uses a “cool the room” strategy;

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- b) uses air economisers or 'free air' strategies;
 - c) vents hot air to the outside;
 - d) hot / cold aisle rack arrangements;
 - e) hot / cold aisle containment;
 - f) in row / rack cooling; or
 - g) point cooling solutions.
- 9.3 The Tenderer should describe provision of space for free standing equipment such as mainframes, tape libraries and large printer systems.

Power Density

- 9.4 The Australian Government estimates, based on the 2008-09 ICT benchmark, that the aggregated power used in FMA agency data centres is around 150 MW. This figure includes the ICT equipment and the mechanical and electrical systems. It is expected that this figure of 150 MW can be reduced, through the efficient use of data centres.
- 9.5 Tenderers should note, that as at 2011, that 500 kW to 1 MW per 500 square metre of data centre space offered will suit most, but not all Agencies. In particular, the science agencies may require 4 to 5 MW per 500 square metres to accommodate their specialised high performance computing equipment. This figure for power demand includes ICT equipment alone, and is exclusive of the mechanical and electrical overheads. Tenderers should also note that this power demand may not be evenly distributed. For example, a large agency may place a mix of blade servers, mainframes, tape libraries and large scale storage area networks in the 500 square metres. The blade servers may require 8 kW per square metre, the mainframe 3 kW per square metre and the tape library 500 watts per square metre.
- 9.6 The power demand is forecast to rise by an average of 5 per cent per annum across all of the Agencies. As measured at the data centre site level, the rate of growth in demand for power may be higher or lower.
- 9.7 The Tenderer should describe the solutions that are employed or proposed to provide different power density requirements. In particular, is there flexibility to provide pockets of higher and lower power density within the data hall?
- 9.8 The Tenderer should describe the maximum and average power (based on kilo watt) and cooling density available per rack/ m².
- 9.9 The Tenderer should state which of the following rack power and cooling densities are supported at the site:
- a) up to 3kW /rack;
 - b) up to 9kW /rack;
 - c) up to 20kW /rack;
 - d) up to 33kW /rack; or
 - e) over 33kW /rack.

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- 9.10 Secure Class B & C racks may present problems with weight and restricted air flow. The Tenderer should describe how these are to be addressed.
- 9.11 The Tenderer should indicate if DC power can be provisioned to the racks.

Data Cabling

- 9.12 The Agencies would pay the normal connection and service costs associated with telecommunications services. Agencies may seek the right to select and use a data cabling contractor of their choice to connect the patch panels (copper and fibre) to the racks. Agencies would ensure that any data cabling contractor that they choose will be suitably accredited to carry out the work within the Tenderer's data centre facilities. The Tenderer should provide details of how Agency nominated contractors could work in the facility.
- 9.13 The Tenderer should detail any data cabling requirements or constraints.
- 9.14 The Tenderer should describe any data cabling standards that need to be complied with within the data centre facilities.
- 9.15 The Tenderer should indicate if under floor or top-of-rack cabling is mandated at the site.

10. Network infrastructure

- 10.1 The Tenderer should describe:
 - a) the internal network cabling infrastructure in use;
 - b) constraints that will be imposed on tenant cabling options; and
 - c) who can install network cabling at the site?
- 10.2 Documentation of all network cabling changes will need to be maintained for renewal of yearly security accreditation. The Tenderer is to indicate who is responsible for maintaining and auditing the accuracy of network cabling changes throughout the year.

11. Mode of Operation

Single or Multi-Tenant Facility

- 11.1 The Tenderer must state whether the offered floor space would be in a data hall for a single tenancy for government agencies or a multi-tenant facility with government and non-government tenants.

Site Access Control

- 11.2 Access to the data centre facilities and each Agency's space should be available to the Agency's authorised staff and contractors 24 hours a day, seven days a week with time/date stamp logging of all access granted and denied. This access includes the ability to load/unload equipment under cover at any time. The Tenderer must describe the technology and processes controlling access to the site, data hall, Agency space and racks.
- 11.3 Where data centres require Agency staff and contractors to be escorted, the Tenderer must state whether staff providing out of business hours escorts will have security certification to attend all areas necessary for Agency tenancies.

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Approach To Quality Management

- 11.4 The Tenderer should describe its approach to quality management; in particular whether it maintains an ISO 9000 accreditation and to what processes this is applied.

Approach To Facilities Management

- 11.5 The Tenderer should describe their approach to managing the facility, including:
- a) cabling, including moves, adds and changes;
 - b) power distribution, including balancing of power loads;
 - c) installation of new equipment by tenants;
 - d) updating of equipment by tenants;
 - e) cooling, including balancing; and
 - f) tenant meetings, including dispute resolution process.
- 11.6 The Tenderer should describe what inter-tenant co-ordination or project management functions the Tenderer performs with regard to data centre configuration management and maintenance.
- 11.7 The Tenderer should describe any “tenant user group” meetings that exist and the related governance arrangements and the provision of feed-back.
- 11.8 The Tenderer should explain how priorities are assigned to different tenancies in disaster recovery situations.
- 11.9 The Tenderer should describe the degree of flexibility they have in the approach to facilities management for each site.
- 11.10 The Tenderer should describe steps taken to minimise and dispose of e-waste and packaging.

Core Services Offered

- 11.11 The Tenderer should describe their account management services.
- 11.12 The Tenderer should note that the Agencies may have existing data centre facilities, or acquire new facilities, that may be used in conjunction with the proposed data centre facilities in active/active, active/passive or disaster recovery configurations.
- 11.13 The Tenderer should describe how they integrate with tenants’ disaster recovery and service continuity plans, including how they arbitrate between multiple tenants during a disaster event and subsequent recovery period.
- 11.14 The Tenderer should describe disaster recovery and service continuity plans, including how they co-operate with other data centre facilities for high availability and failover purposes.
- 11.15 The Tenderer should detail the existing emergency procedures and business continuity strategies for the data centre facilities, including how the Tenderer would be able to continue providing the data centre facilities during a business-disruptive local, regional or national event.

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- 11.16 The Tenderer should provide examples of where it has co-operated with other data centre facilities in similar configurations used in conjunction with the data centre facilities offered.
- 11.17 Australian Government agencies are required to report upon their energy and water consumption. The Tenderer should describe:
- a) the details and frequency of reports to tenants on both the direct and indirect energy use. Indirect energy use includes cooling, lighting and a proportion of shared areas;
 - b) detail the granularity of reporting that is available, for example, gross tenants consumption or with a breakdown by zone, module, rack or unit; and
 - c) provide a sample of an energy use report.
- 11.18 The Tenderer should describe how they would assist tenants in calculating the Power Use Efficiency for each tenant, and provide an example of this reporting.
- 11.19 The Tenderer should describe how and when data centre cleaning and housekeeping tasks are performed.
- 11.20 The Tenderer should note that Australian Government agencies are subject to changes in Government policy from time to time. In particular, the National Australian Built Environment Rating System (NABERS), is likely to be applied to Agencies, and to their suppliers.
- 11.21 The Tenderer should indicate their level of understanding of NABERS and their preparations for compliance.

Value-Added Services Offered

- 11.22 Some Agencies may require additional services. The Tenderer should indicate the details of the available support services and facilities management options. The Tenderer should align these descriptions to the Services in the Pricing Schedule.
- 11.23 The Australian Government considers that there is a range of services that may be of value to its Agencies. These include:
- a) complex fluid dynamics modelling;
 - b) alarms and alerting;
 - c) remote monitoring and management;
 - d) disaster recovery configuration management;
 - e) disaster recovery failover execution;
 - f) access; and
 - g) cabling.

Additional Fees

- 11.24 The Tenderer should identify any additional service fees that may be charged to Agencies over and above fees covered in the Contract, for example: Security escorts, issuing passes, diesel fuel reserves held on-site.

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12. Strategic Opportunities

Electrical Efficiency

- 12.1 The Australian Government Data Centre Strategy 2010-2025 intends to avoid \$1 billion in future data centre related costs. This requires efficiently managing both the ICT equipment in the data centre and the data centre facilities. This creates opportunities for joint activities between Agencies and the successful data centre providers.
- 12.2 In developing the Strategy, the project team took note of general guidance on improving data centre efficiency from the European Union and from the United States of America. The following table, from the Environmental Protection Agency’s (EPA) Report to US Congress on Data Centre Energy Efficiency, Aug 2007, identifies the types of actions that may be taken to improve the efficiency in using electricity in data centres and the possible benefits.

Scenario	IT Equipment	Site Infrastructure (Power and Cooling)
Improved Operation	<p>The base measures are:</p> <ul style="list-style-type: none"> • continue current trends for server consolidation; • eliminate unused servers (e.g., legacy applications); • adopt “energy-efficient” servers to modest level; • enable power management on 100% of applicable servers; and • assume modest decline in energy use of enterprise storage equipment. 	<p><u>30% improvement</u> in infrastructure energy efficiency from improved airflow management</p>
Best Practice	<p>All measures in “Improved operation” scenario, plus:</p> <ul style="list-style-type: none"> • consolidate servers to moderate extent; • aggressively adopt “energy-efficient” servers; and • assume moderate storage consolidation. 	<p><u>Up to 70% improvement</u> in infrastructure energy efficiency from all measures in “Improved Operation” scenario, plus:</p> <ul style="list-style-type: none"> • improved transformers and Uninterruptible Power Supplies; • improved efficiency chillers, fans, and pumps; and • free cooling.

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State-of-the-Art	<p>All measures in “Best practice” scenario, plus:</p> <ul style="list-style-type: none"> • aggressively consolidate servers; • aggressively consolidate storage; and • enable power management at data centre level of applications, servers and equipment for networking and storage. 	<p><u>Up to 80% improvement in infrastructure energy efficiency</u>, due to all measures in “Best Practice” scenario, plus:</p> <ul style="list-style-type: none"> • direct liquid cooling; and • combined heat and power.
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- 12.3 The Tenderer should describe how they would work with Agencies to optimise data centre efficiency, with particular emphasis on electricity, water and waste. This could include shared responsibilities, risks and rewards.
- 12.4 The Tenderer should propose any other methods that would reduce the Australian Government’s costs, for data centres housing Agency ICT equipment.