AGENDA ITEM NO 9
REPORT NO 615/11

ANGUS COUNCIL – 15 SEPTEMBER 2011

NEW DATA CENTRE ENVIRONMENT

REPORT BY DIRECTOR OF CORPORATE SERVICES

ABSTRACT:
This report seeks approval to provide an appropriate data centre environment for the council’s critical information systems and services.

1. RECOMMENDATIONS

   It is recommended that the Council:

   (i) approve the provision of an appropriate data centre environment for the council’s critical information systems and services (Option 1 as detailed in Appendix 1 to the report);

   (ii) approve the funding package outlined in the Financial section of this report;

   (iii) note that this investment will contribute to mitigation of the risk that services are disrupted as a result of IT infrastructure failure identified in the Corporate Risk Register; and

   (iv) note that an exercise is being undertaken to progress proposals for provision of a secondary support data centre facility and this will be the subject of a future report in early course.

2. CURRENT POSITION

   2.1 The council currently has a primary data centre formerly located within County Buildings, Forfar and now located temporarily within the Octagon building behind the Mart, Forfar, together with a number of other data centres and smaller server rooms across the council estate. At the time of creating these data centres and server rooms it was best practice to have file and print servers, and operational application servers, on the same Local Area Network (LAN) as the staff requiring access to these servers which by implication meant that this was normally in the same building. This was mainly due to the limited bandwidth available over the Wide Area Network (WAN).

   2.2 As a result there are currently a significant number of small to medium data centres and server rooms. These rooms are in many cases also now not fit for purpose as there is no formalised technical monitoring equipment applied to the environment supporting the IT equipment within the rooms and due to this, incidents have occurred where air conditioning units have failed and detection has only occurred when servers have automatically shut down due to high temperature levels.

   2.3 In addition, the resource implications of monitoring and managing disparate data centres may be regarded as unnecessary as the council continues to transition to the centralised systems required to support staff agile working capabilities.

   2.4 As the council has become more reliant on information technology systems and infrastructure, better resilience than is available at present is required as recent events have shown, and it is vital that best practice for hosting applications and data is assessed and implemented.
Investment already made to upgrade the core communications network has provided an enhanced infrastructure and offers the opportunity to rationalise and consolidate the server estate, and therefore the number of server rooms.

Further, the power, cooling and water ingress issues when the main data centre was located at County Buildings have highlighted the significant risk to continued availability of IT Services due to the operational environment in that location. These issues have resulted in the relocation of critical IT Services from the data centre at County Buildings to a temporary location within the Octagon building. The facility at the Octagon has limited space for only 6 server racks (currently fully utilised hosting on average 20 servers per rack) with no scope to house more racks within the available space. The current arrangement for cooling is that there is only available space for 2 air conditioning units. A test has shown that in the event of the failure of one unit, the remaining unit does not have the capacity to maintain an effective operational environment, therefore not providing the required resilience. Current backup is provided by a standalone unit requiring manual intervention to activate. The County Buildings data centre was covered by monitoring equipment managed by Property Division, however, this is not currently available within the Octagon, and therefore, there is a risk that if one unit fails we would have overheating within the building until the manual unit could be activated. To provide additional protection a remote monitoring system is being implemented for the Octagon that can then be reused in the new Data Centre.

3. PROPOSAL

In light of the above it is critical that a fit for purpose environment to host essential IT Services is established. Utilisation of best practice in the design of a new data centre will improve resilience by providing a purpose designed technology environment, thereby reducing the risk of disruption to essential public services. Best practice utilised includes:

**Design:**
- Sealed room environment
- Lights out operation
- Cold aisle containment cooling
- Resilient power provision
- Eco / environmental cooling
- Fire suppression
- Environmental monitoring
- Pre-installation test area
- Access control system

**Resilience in power provision:**
- Primary - clean mains supply
- Secondary – diesel generator
- Transition / power smoothing – dual modular uninterruptible power supply

**Environmental cooling system:**
- Use of ambient temperature air
- Water evaporative cooling
- Resilient failover of a single unit
- Standby de-humidifiers

**Fire suppression system:**
- Sealed room gas flood extinguishant

**Environmental monitoring system:**
- Temperature
- Humidity
- Cooling
- Power
- Water ingress
- Access control
3.2 It is essential that the data centre is located at a core point on the council’s network infrastructure, with only 2 locations capable of providing optimum performance and resilience, these being County Buildings and the Orchardbank Campus.

3.3 A detailed options appraisal has been jointly undertaken by Information Technology and Property staff based on latest technical information, operational requirements, potential future growth, assessments of risk and resilience capability.

3.4 Options considered included a new build extension to the Print and Design Unit on the Orchardbank Campus, re-use of internal space within the Print and Design Unit, re-use of internal space within Angus House and procurement of a modular Performance Optimised Datacentre (POD) hosted by a third party provider. The possibility of a co-hosting provision in the form of a shared service with neighbouring local authorities was also explored. However, due to capacity constraints and relative cost it was concluded that this did not represent a viable option at this time and no further work beyond the initial investigation discussions was carried out.

3.5 The assessment considered fitness for purpose and cost (see Appendix 1), resulting in a recommendation for an extension to the Print and Design Unit as the most viable option to provide a fit for purpose data centre to meet current and future requirements in a robust and resilient manner.

3.6 It is anticipated that, due to the modern design of the proposed data centre, utilising ambient air cooling, more efficient uninterruptible power supply and lower power consumption server equipment, future savings in power consumption will be achieved resulting in energy cost savings and a contribution to the council’s carbon reduction commitment.

3.7 While this proposal significantly reduces the risk of a critical failure, some risks can never be fully removed, as single points of failure outwith council control such as reliance on externally provided data circuits, will remain. However, it should be noted that this area of risk is being explored as part of the Council’s ongoing business continuity management review process arrangements and specific contingency plans will be put in place for all such events.

3.8 Further, any unique location will remain a potential single point of failure. However, plans are being progressed to identify options to further improve resilience by removing the uniqueness of the data centre as a single point of failure.

3.9 It is anticipated that any secondary provision will provide resilience for critical IT systems in the event of a number of differing failure situations:

- Total loss of primary data centre
- Loss of external data communications to primary data centre
- Failure of data storage infrastructure at primary datacentre
- Failure of systems access at primary data centre
- Failure of critical applications at primary data centre

3.10 The design of any secondary provision will take a risk based approach, and will operate on the basis of a reduced overall capacity/capability, this will allow some failover between the facilities, however, will not duplicate all IT systems and services.

3.11 Secondary facility reduced capability:

- NO Generator power resilience – not required on a risk management basis other than in the case of total loss of primary data centre, in this case a generator can be provisioned in 48 hours
- Reduced physical space will NOT enable resilience for all operational IT systems, these having business continuity arrangements established by service departments. In the event of total loss of the primary data centre, adjacent physical space will be utilised to extend the secondary facility on a temporary basis

3.12 A further report, identifying options to further improve resilience will be presented at the earliest opportunity.
As an additional benefit, relocation of IT Services to the new data centre will release a number of existing data centres and smaller server rooms as surplus to requirement at various locations, resulting in energy savings and space available for re-use as part of the Corporate Asset Management Group review to improve property asset utilisation.

4. RISKS

This proposal reduces the council’s overall risk exposure to the Information Technology infrastructure by providing a fit for purpose data centre to host the councils critical IT systems and services, thereby, mitigating risks identified in the corporate risk register. The proposal carries risks to its implementation in regard to procurement and construction of the facility that will be managed by a joint Property / Information Technology project team.

5. FINANCIAL IMPLICATIONS

The capital cost of the new data centre has been estimated at £695,000 as shown below:

<table>
<thead>
<tr>
<th>Description of Works</th>
<th>Estimate of Probable Cost £,000</th>
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<tbody>
<tr>
<td>Building Work:-</td>
<td></td>
</tr>
<tr>
<td>New Extension (including Gas Suppression System)</td>
<td>185</td>
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<tr>
<td>Alteration Works to Existing Building</td>
<td>10</td>
</tr>
<tr>
<td>External Works</td>
<td>65</td>
</tr>
<tr>
<td>Specialist Engineering (including Eco Cooling / Ventilation, Uninterruptible Power Supply, Backup Generator, Electrical Power Provision, Building Management System)</td>
<td>340</td>
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<tr>
<td>Allowance for Professional Fees</td>
<td>95</td>
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<tr>
<td>Total</td>
<td>695</td>
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The capital cost can be met from available resources as follows:

<table>
<thead>
<tr>
<th>Funding Source</th>
<th>Commitment £,000</th>
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<tbody>
<tr>
<td>Information Technology Renewal and Repair Fund:-</td>
<td></td>
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<tr>
<td>Current project commitment (est’d net funding requirement)</td>
<td>250</td>
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<tr>
<td>2010/11 Internet recharge income earmarking</td>
<td>245</td>
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<tr>
<td>Contribution from Corporate Services ring fenced balance</td>
<td>55</td>
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<tr>
<td>2010/11 Corporate Services Revenue agreed 100% carry forward</td>
<td>70</td>
</tr>
<tr>
<td>2011/12 Corporate Services Information Technology one-off revenue contribution</td>
<td>75</td>
</tr>
<tr>
<td>Total</td>
<td>695</td>
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The recurring revenue cost, non-domestic rates, relating to service maintenance contracts, heat, lighting, cleaning etc estimated at £42,000, cannot be specifically contained within the Information Technology division revenue budget and will be considered as part of the wider Corporate Asset Management Group review work incorporating compensating savings through alternative use of the vacated data centre and server room sites. The determined net financial equation will be fed into the 2012/13 and beyond budget preparation process.

6. HUMAN RIGHTS IMPLICATIONS

There are no Human Rights implications arising from this report.

7. EQUALITIES IMPLICATIONS
The issues contained in the report fall within an approved category that has been confirmed as exempt from an equalities perspective.

8. SINGLE OUTCOME AGREEMENT

This report contributes to the following local outcome contained within the Single Outcome Agreement for Angus:

- COMMUNITIES THAT ARE SUSTAINABLE – Our carbon footprint is reduced

9. CONSULTATION

The Chief Executive, Head of Finance, Head of Law and Administration and Head of Property have been consulted in the preparation of this report

COLIN McMAHON

DIRECTOR OF CORPORATE SERVICES

NOTE: No background papers, as defined by Section 50D of the Local Government (Scotland) Act 1973 (other than any containing confidential or exempt information) were relied on to a material extent in preparing the above report.

IT/CS/NSM