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SHARED HOSTING OF THE REFERENCE CDMS TOOL SET

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SHARED HOSTING OF THE REFERENCE CDMS TOOL SET

1 BACKGROUND

1.1 Reliable climate information with clearly documented provenance is critical to the successful delivery of climate services. The reference CDMS tool set is being developed to provide a computer-based system to help organizations manage their climate-relevant information. Although this open source system is being developed to be easy to use, it still needs a reliable computer system on which to run. Running such a computer system, particularly one that has to maintain a highly reliable archive component, can be expensive and draw on skills that are in short supply.

1.2 WIS 2.0 will provide standards for sharing not only data, but also the computing resource to store and process that data. These standards will be built on industry-standard cloud computing techniques, but will refine these to improve compatibility of implementation among users of meteorological and related information.

1.3 The reference CDMS tool set will be compatible with the WIS 2.0 standards.

1.4 Running software tools to support climate data management needs access to a reliable computer infrastructure and experts to maintain both that infrastructure and the software itself. Whereas a large organization would be able to run a sufficiently large team of skilled staff to do this, this would place a great strain on the resources of smaller organizations. In the commercial sector, large organizations are able to maintain their own infrastructure or to maintain their software on cloud-based computers. Small organizations are increasingly turning to cloud-based applications to meet their needs because they do not have the resources to maintain the applications themselves.

2 SHARING COMPUTER RESOURCE

2.1 Sharing of computing resources is not a new concept. In the 1960s, "time sharing services" allowed companies that could not afford their own computer systems to use time on a computer operated by a specialist company. The advent of mini- and micro-computers led to more organizations running their own computer systems, but the hidden costs of managing such systems (both financial and availability of skilled people) led to increased interest in using shared systems. Familiar examples of such systems are the online email systems used by many individuals and organizations.

2.2 The standards and facilities that were developed to support the internet have impacted on how computing resources are shared. In addition to owning their own computer hardware and software, and operating and maintaining these themselves, organizations now have a range of options:

2.2.1 **Infrastructure as a service** provides the computing and storage needed to run computer applications. The physical hardware and storage are managed by the supplier. The operating system and any applications are managed by the user.

2.2.2 **Platform as a service** not only provides a managed hardware environment, but also includes the operating system and fundamental applications. The users appears to have a computer for their own use on which they can install and run their own applications (though in practice they are likely to be using a "virtual" computer on hardware that is shared with others).

2.2.3 **Software as a service** adds the application software to the offering. The supplier looks after applying the system and application updates, but the user is still responsible for configuring and administering how the software works – and probably also managing the storage and backups.

2.2.4 **Application as a service** provides the highest level of support from the supplier. In this offering, the user just logs on and uses the application without having to worry how to configure or maintain it. They just enter data and tell it what to do.

3 USING THE REFERENCE CDMS TOOL SET THROUGH A SHARED SERVICE

3.1 The reference CDMS tool set software will be able to run several distinct and non-interacting logical instances within a single actual instance of the software. This means that it will be possible to host several operational and test CDMSs but to manage them as a single unit. This capability would make it possible for an NMHS, a cooperating organization or a commercial company to offer a cloud “application as a service” implementation of the reference CDMS tool set that Members and organizations within them could use to manage their climate-relevant data in the knowledge that users from other Members or organizations could not access their data or configuration, but the costs of running and maintaining the software and system would be shared between the users.

3.2 Organizations considering whether they should use a shared service to support their climate data management may wish to assess whether they might need to mitigate the following risks:

7.1 Supplier ceases to operate the service (or becomes too expensive) – the impact is mitigated by the open source nature of the application, but the user needs to have backups held separately from supplier and to be prepared to seek another supplier;

3.2.2 Inadvertent exposure of data – national legislation may prohibit storage of some types of information outside its jurisdiction (this typically applies to personal data); in the context of climate-relevant data the metadata are most likely to be subject to such constraints. Users will also need to perform due diligence to assure themselves that the supplier is taking sufficient precautions to prevent other users of the system accessing data that they are not authorized to access;

3.2.3 Loss of access to data – although backups exported from the system provide a means of avoiding actual loss of data if the supplier denies access to the system, it might take considerable time to restore these data to a system run by a different supplier;

3.2.4 From a regional perspective, an “application as a service” provider is potentially a single point of failure that impacts on the availability of climate-relevant data in the region. A higher level of due diligence might be needed for suppliers that support a large number of Members.

3.3 Despite the risks, use of an “application as a service” supplier, whether another NMHS or a commercial company, offers a way of reducing other risks. Typically, these might include:

3.3.1 Unavailability of specialist ICT staff – the role is undertaken by the supplier, so the user does not need access to such staff;

3.3.2 Lack of skills to operate and maintain the CDMS system to an adequate standard – the software (and possibly its configuration if required) would be managed by experts in the system enabling it to be run to higher standard than possible locally;

3.3.3 Cost of running the system and the hardware on which it runs – using an application as a service approach shares costs among several users;

3.3.4 Business continuity in the event of system problems - business continuity support can be higher in shared environment because the costs are shared between users.

3.4 Although use of an application as a service instance of the reference CDMS tool set offers benefits in terms of risk and cost reduction:

3.4.1 There will still be costs for using the system and some local infrastructure will still be needed for users to access the system;

3.4.2 A reliable telecommunications network connection is needed between the user and the provider;

3.4.3 The service will be handling valuable information and the user will need reassurance that the supplier will handle it correctly.