STATE OF MONTANA
DEPARTMENT OF ADMINISTRATION
STATE INFORMATION TECHNOLOGY SERVICES DIVISION

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Montana Cloud Hosting Framework

**SCEG
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EXHIBIT 4**

INTRODUCTION

The cloud services hosting market is maturing but is not yet fully meeting the hype and expectations seen in the media. However, government entities, including Montana, are reaping benefits of cloud service hosting with cost savings and operational efficiencies. The state is already using a select number of cloud hosting services with success. Currently, Microsoft is hosting a spam filtering service for the state email system. The State Department of Justice has their website hosted by a cloud hosting service provider. The Secretary of State is also having their business process management software hosted by the vendor.

The continuing issue for Montana is to manage the fine line between maximizing the advantages of cloud service hosting, while minimizing the risks. To accomplish this, the State CIO with recommendations from the Information Technology Managers' Council (ITMC), will collaboratively work to develop detailed processes and procedures to manage usage of cloud hosting.

FRAMEWORK

The framework for developing the processes to manage the use cloud hosting services must focus on three main areas; requirements, procurement, and infrastructure. The results of the investigation into these areas will highlight which cloud hosting solution provides the greatest benefit to the state.

The first main area is that of procedural and business requirements. The cloud hosting solution must meet or conform to legal, regulatory, and contractual mandates. These requirements are especially true for information security. For example, some information security mandates may require that a cloud hosting provider obtain a special certification for how they secure their systems. Once it is determined that any special requirements will be met, then the hosting solution needs to be evaluated to ensure that the solution meets the organization's business requirements. A hosting solution needs to offer the right solution for the agency, execute on that solution in the right manner, and actually produce value for the agency.

The second main area is procurement. First and foremost, the state and state agencies must comply with procurement law. In addition the state needs to determine whether the contract language and/or terms and conditions are agreeable. Items such as adjudication, jurisdiction, and venue must be carefully examined and addressed in any contract. Through the procurement process, the state also needs to ensure that the actual hard and soft costs of the cloud hosting solution are fully understood. Cloud hosting providers do not charge for services in the same manner and what is included or is an extra cost is not obvious in the vendor pricing structure. Some analysts see differences in pricing models as tactics taken by cloud providers to obtain competitive pricing advantages and marketing.

The greatest payback in using cloud hosting providers comes from large economies of scale or in a commodity service. The State CIO will actively look for and push organizations toward these types of cloud hosting solutions that benefit the enterprise as a whole.

The third and final main area is supporting infrastructure. Cloud hosting solutions can either be all internal (private cloud), all external (public cloud), or a combination of both (hybrid cloud). In each case, the reliability of the solution is determined by the infrastructure. However, with external cloud hosting, the network infrastructure for connecting to the Internet is most critical. The increased usage of external cloud hosting providers may require reallocation of some individual program savings to increase infrastructure capabilities.

CLOUD DRIVERS/BENEFITS

- Both public and private cloud hosting can deliver significant economies of scale.
- Cloud based services can reduce the up-front costs of implementation and potentially management of a program. Complex multi-year procurements and implementations may be avoided in some cases through use of standardized cloud services.
- The purchasing power of the multi-state public cloud WSCA contract will add to that cost savings.
- Services that are appropriate for a private or public cloud hosting environments will vary widely. Some applications (e.g., heavy data update traffic) are not well suited for the public cloud environment, while others (e.g., peak load processing) are perfectly positioned.
- Cloud hosting moves IT purchasing away from irregular capital expenditures towards more predictable operational budgeting based on purchasing services.
- Cloud hosting allows agencies to become more responsive to unforeseen immediate demand for services (e.g., Yellowstone pipeline spill).
- Given proper cloud utilization reporting structure, hybrid cloud computing could provide more IT budget transparency, technical flexibility and increased collaboration across organizational lines.
- Moving some portion of Montana's computing infrastructure to cloud services is inevitable. Most organizations will move at least a portion of their computing environment to private and public cloud utilization within the next five (5) years for purely economic reasons. However, they need do this in an organized and judicious manner that is almost directly proportional to the maturing of the cloud marketplace.

CLOUD DRAWBACKS

- Public cloud hosting is a maturing marketplace. As the market evolves over the next 5-7 years, vendors will drop out, merge or go bankrupt until the public cloud marketplace and the supporting technology reaches economic equilibrium.
- Transparency across organizational lines may cause disruptions in service as the business model is adjusted to reap the collaborative rewards. The process of change will have business, staff, and political implications which will require careful consideration and delicate implementation.
- The impact of public cloud services to the state network could potentially increase bandwidth usage and costs.
- Certification of Federal security standards are under development by public cloud providers. There no universally accepted standards within the public cloud for data interchange, data recovery, or data extraction. Changing from one cloud provider to another could be time consuming and costly.
- Cloud services are usually web based and can be purchased with a state or personal credit card. The State needs to make sure agencies are following normal purchasing procedures and requirements.

- Venue, applicable laws, and other contract terms and conditions for cloud providers need to be negotiated with Cloud providers to obtain mandated requirements.

RECOMMENDATIONS

Montana should consider the deployment of a coordinated, hybrid cloud hosting environment across agency IT resources, vendor provided public clouds, and our own State private cloud.

Additionally, the General Services Division (state purchasing) and the State Information Technology Services Division of the Department of Administration should develop policies and processes that allow the Department to monitor and manage overall departmental, state enterprise, and public cloud usage by state agencies.

To implement the framework and address the three main areas of concern the Department of Administration should:

1. Develop a standard public Cloud hosting contract template with required terms and conditions.
2. Develop a checklist/template for evaluating potential cloud services for:
   a. Business, security, and technical requirements
   b. Procurement methodology
   c. State infrastructure impact including network resources.