



White Paper: Cloud Piping

July 29, 2010



*Supporting government agencies
through geospatial solutions.*

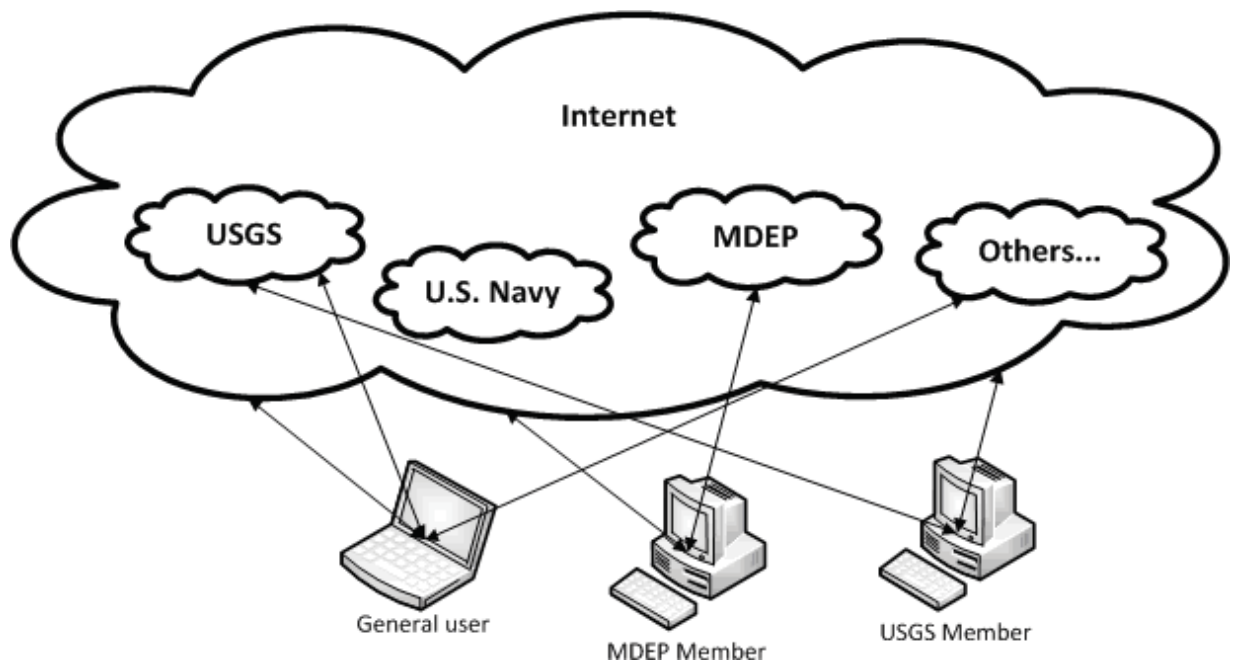
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Cloud piping is a phrase coined to describe a process developed at the Mojave Desert Ecosystem Program (MDEP) for establishing a constant connection from one cloud to another. This is achieved using either administrative efforts, technical solutions or a combination of both. This process does not follow a constant method or set of tools for each implementation due to each organizations cloud makeup and administrative methods. The MDEP defines cloud piping as one organizations cloud connecting to one or more external clouds for the exchange of specific and authorized data, allowing users to remain in their organizations environment while access a wider scope of data. This paper will go into detail of the current cloud computing environment within the public sector and how this process differs from other known solutions.

Wikipedia defines “Cloud Computing” as: “Cloud computing is Internet-based computing, whereby shared resources, software and information are provided to computers and other devices on-demand, like electricity”*.

This diagram gives a general view of how cloud computing currently operates:



CLOUD PIPING

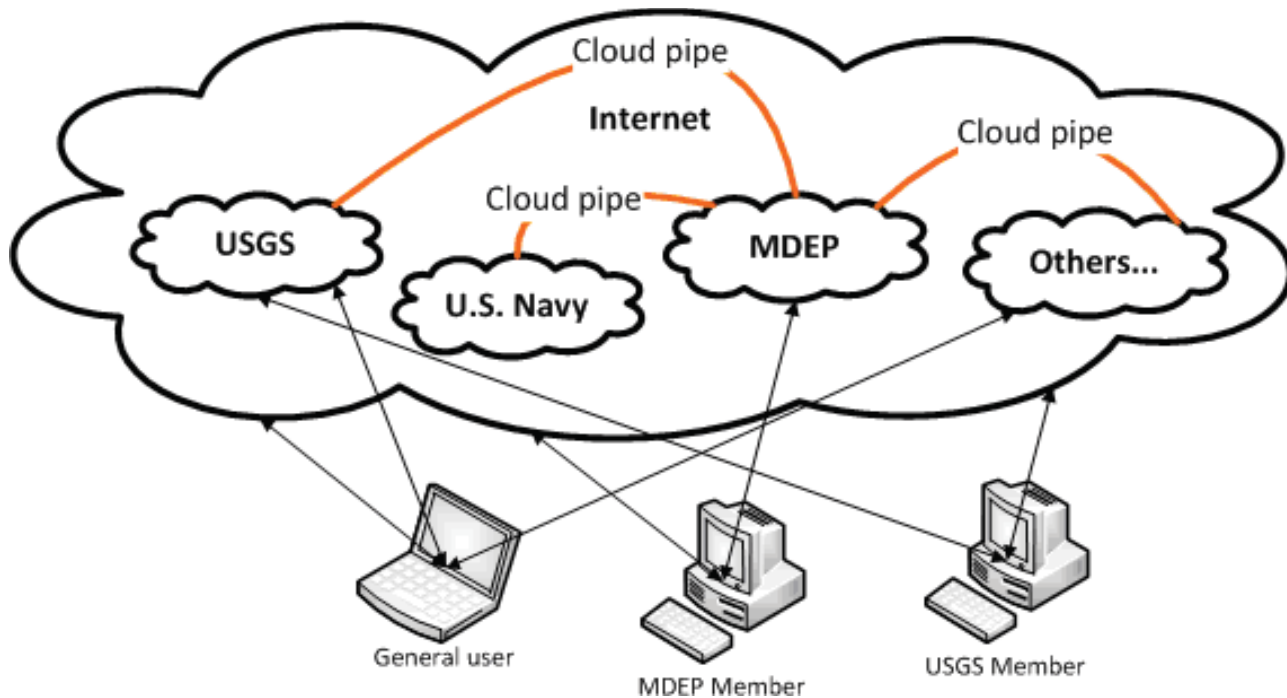
The cloud concept operates in two general ways. The first most common is pushing data to the internet so various users can access generally approved information that each group manages. The next common activity a cloud environment provides is a virtual work space for members of an organization to operate within. The cloud environment in an organization provides software as a service, group sharing solutions and data that is supported by the host organization for many to access. Looking at the diagram above an issue comes when a user within a certain cloud needs data from another cloud source. As of now these data requests have been handled by individuals who either locate data from one source and duplicate it in another cloud or gain access to another cloud source through methods such as file transfer protocol (FTP). From the individuals perspective this requires them to leave their cloud environment and access an additional environment if they can gain access. More than likely this environment operates differently than their host environment causing confusion, delay in product and conflict in accessibility. From the host cloud Information Technology (IT) group's perspective a user now leaves their developed process to access another process for data and possibly transfers additional data into their environment. This could require additional resources to maintain the new data that is already hosted in another cloud environment. Most cloud users do not fully understand the capabilities of their cloud and so new data that is introduced may not be in the most functional form for full utilization within the cloud. Organizations design their cloud environments based around their mission and to influence how users operate within the cloud. The main goals for the host cloud are both reduced cost and improved productivity. These goals break down once a user leaves the cloud to access or work with data in another system or process.

The need for a process such as cloud piping came about due to an industry shift from data repositories within an organization to the consolidation of data into a central cloud environment. Many government agencies are working to reduce the number of locations that have servers that support an area so that more data is shared across the entire agency while trying to reduce cost. Data requests before clouds by outside individuals or groups became periodic activities and were targeted at individuals who maintained certain types of data. Techniques such as emailing data or establishing file transfer protocol (FTP) have been in practice but are complicated and may not be feasible depending on the amount of data requested. Clouds offer constant access to data, no matter the amount of data being accessed, across an organization but only if one has access. Data requests from outside groups now go through the cloud and reaching the right subject matter experts for certain types of data becomes a bit more complicated. Clouds are accessible through the internet but users have access based on provided credentials. The groups

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that may be allowed to access data that had a process such as FTP or other methods may find those processes turned off or lost due to the growth of the cloud process and or other issues like security.

Below is a diagram of the cloud piping process:



Through the process of cloud piping an organization would interact with another organization to discuss the establishment of a constant connection or cloud pipe. These discussions would be done at the group or organization level and not at the user level. The diagram above shows a very U.S. Government centric process but this concept can migrate to other organizational models as well. Each organization would establish a need for data that the other agency or cloud may have or work with on a constant basis. Once each group has identified their needs then the discussion on how to establish access between the two begins. Some groups have systems in place that once the administrative authorization has been completed then it is up to the IT groups in each cloud to establishing a cloud pipe. Other situation may require that systems and or standards be adjusted so that data that is constant between the two groups are kept in a functional state for both groups. One should keep in mind that a cloud pipe is established to access specific types of data and not to allow complete access to each groups cloud. With current technology and software these solutions can be implemented with minimal

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efforts, designed around current operational process and complement each groups data sets. A goal when attempting this process of cloud piping is that this should be a onetime event for the IT groups involved. A benefit to each cloud from the IT group's perspective will be keeping users of an organization working in their host environment. This should also help to reduce the amount of duplicate data while helping to create unique data within each cloud. Increasing productivity and either maintaining or help to reduce cost.

Some of the more common tools used currently in this process are ESRI Arc Server, Microsoft SharePoint and others that can be configured to support this activity. The cloud piping process is not tied to any particular type of software or hardware so each IT group should analyze current resources to find solutions between the two clouds to establish the cloud pipe. This concept goes beyond the establishment of the typical file transfer protocol (FTP) process to allow software solutions that are in place or typically found in most operations to help manage and make available data with minimal effort for all involved. Organizations should understand that the process requires many groups within an organization to discuss the cloud piping process and implementation; it is a group effort for both organizations. The beginning may be difficult in how to establish the cloud pipe but in the long run the cloud environments will benefit from reduced data storage, current data on piped products and controlled or reduced cost in data operation.

For more information or questions on the cloud piping process please contact us at:

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Wikipedia source: http://en.wikipedia.org/wiki/Cloud_computing (09/26/2010)

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