Unidata Cloud-Related Activities

Unidata Users Committee Meeting
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Overview

• Three ongoing efforts, broadly speaking.
• Unidata developers are incorporating the cloud and cloud-based products/services into their workflow.
Internal Tools

- Github: Revision control, issue tracking, collaboration.
- Binstar: Binary python packages.
- CDash: Dashboard for software testing.
Internal Tools

• Vagrant: Cloud-enabled VM management for developers & scientists.
  • NetCDF testing exists inside VMs deployed by vagrant.
  • Git repository: [http://github.com/WardF/tiny-ci](http://github.com/WardF/tiny-ci)
Internal Tools

• Vagrant: Cloud-enabled VM management for developers.

• Data Science Toolbox
  • Virtual Environment for data science.
  • http://datasciencetoolbox.org
Ongoing Projects

- AWIPS II Cloud Servers
- IDD Product Generation and Additional Experimentation
- IDV Application-Streaming Cloud Servers
AWIPS II Cloud Servers

• Unidata is testing small footprint **EDEX** servers (no **NEXRAD** Level 2 or 3 or high-resolution **CONDUIT** models) on both **Microsoft Azure** and **Amazon EC2** cloud server environments.
AWIPS II Cloud Servers

• EC2 Instance is created cooperatively with Embry Riddle Aeronautical University (ERAU) as part of their equipment grant award.
AWIPS II Cloud Servers

- The Azure instance is serving data to AWIPS II 14.2.1 beta testers.
IDD Product Generation and Additional Experimentation

• Unidata operates mid-sized instances in Azure and Amazon EC2 clouds.
• These instances are being used to generate image products for the IDD FNEXRAD and UNIWISC data streams.
IDD Product Generation and Additional Experimentation

- EC2 Instance is the primary source of FNEXRAD and UNIWISC data streams to IDD participants.
- We will be transitioning to Azure cloud instances to reduce recurring costs, due to an resource award from Microsofts Azure-for-Research program.
IDD Product Generation and Additional Experimentation

IDD volume summary for amazon-ecw2_1.unidata.ucar.edu
140911/2300 to 140913/2100 UTC

Legend:
- EXP
- F NEXRAD
- HDS
- NEXRAD3
- UNI WISC
IDD Product Generation and Additional Experimentation

IDD volume summary for azure_miniload2-unidata.ucar.edu
148911/2300 to 148913/2100 UTC

MEGABYTES

EXP  FNEXRRD  HDS  NEXRAD3  UNIWISC

12/00 12/06 12/12 12/18 13/00 13/06 13/12 13/18
IDD Product Generation and Additional Experimentation

Note that the Y-axis scale is different for Amazon (left) vs. Azure (right).
**IDV via Application Streaming**

- **Goal:** Create and provide IDV instances which live in the cloud but may be *streamed* to various devices.
- **Drawback:** The interface is adapted to the target device but is not optimized for it.
- **Benefit:** Brings the IDV to new classes of devices without needing to modify the IDV.
Application Streaming?

- Application Streaming is similar to remote desktop technology, but is meant to stream a single application.
- The server instance is optimized for the dimensions of the remote client device.
- Consider Netflix, Amazon Streaming Video.
Status

• Using the Azure Web API, we are able to dynamically allocate and provision VMs used to host individual IDV instances.
• We are then able to instantiate IDV instances then streamed (via existing remote-desktop protocols) to mobile devices.
Next Step

• Current efforts are focused on creating a web dashboard which will allow users to register and manage IDV-streaming requests.

• As of right now, instances are instantiated via the command line.
Performance

• How well does it perform?
• Performance is tied to the client used.
  • Dedicated clients such as "Parallels Remote Access" or "Air Login": Very good, typically adapted to touch interfaces.
  • Generic VNC clients: acceptable, but suffer from inconsistent interfaces between clients.
VNC Demo
Parallels Access Demo
Future Work

• As a first attempt, the results have been very promising.
• Moving forward: generic VNC access or dedicated client access?
• The latter would be preferable given infinite resources, but we have not been given infinite resources (yet).
Summary

• Unidata is proceeding into the cloud along multiple fronts.
• These projects are no longer speculative.
• What we learn from these projects will aid future projects.
• Recording an iPad screencast is difficult.
Questions?