

Unidata Cloud-Related Activities

Unidata Users Committee Meeting
September 2014
Ward Fisher

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>

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

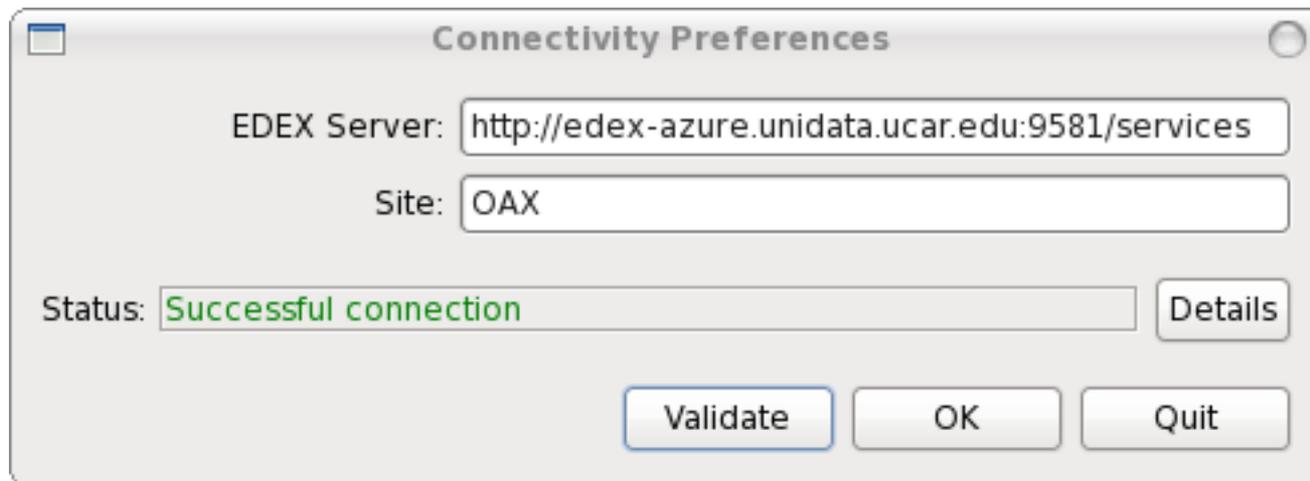
- Unidata is testing small footprint **EDEX** servers (no **NEXRAD** Level 2 or 3 or high-resolution **CONDUIT** models) on both **Microsoft Azure** and **Amazon EC2** cloud server environments.

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

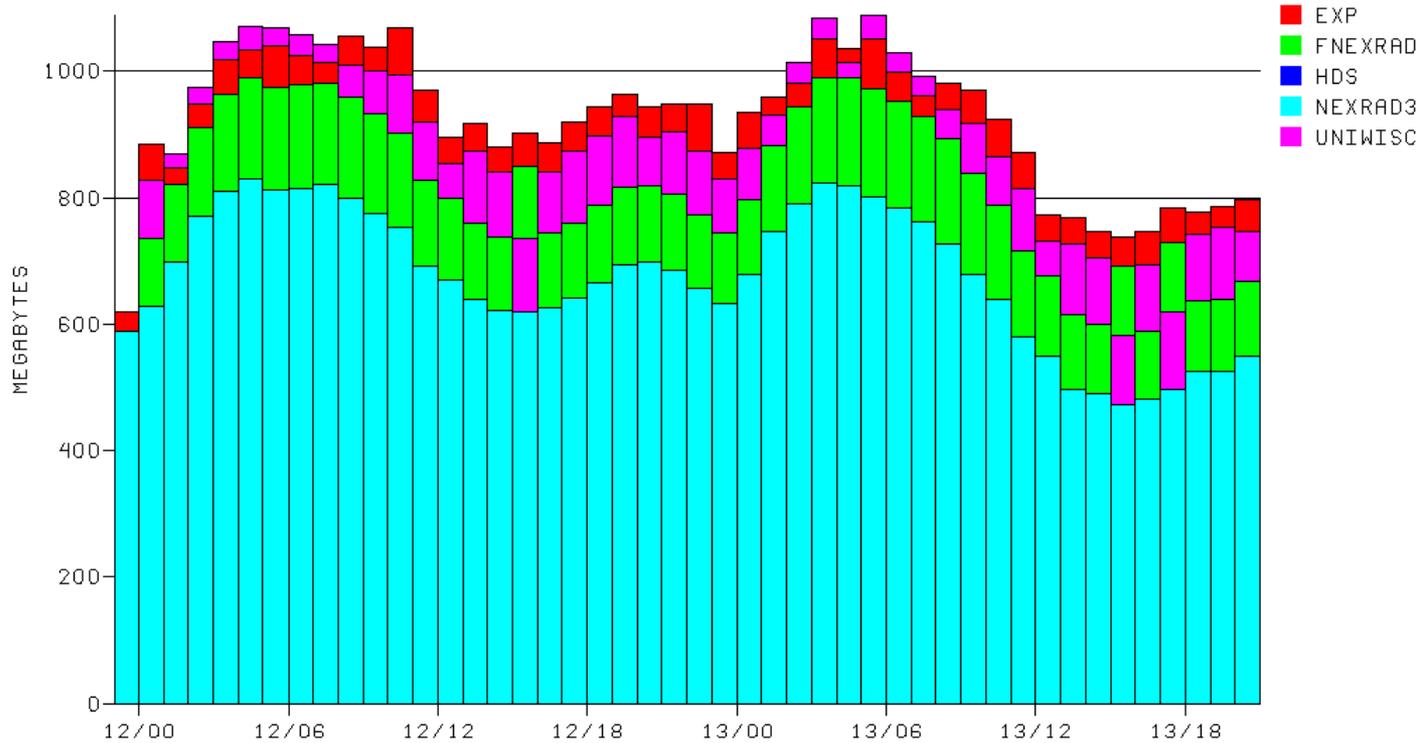
- Unidata operates mid-sized instances in **Azure** and **Amazon EC2** clouds.
- These instances are being used to generate image products for the **IDD FNEXRAD** and **UNIWISC** data streams.

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.

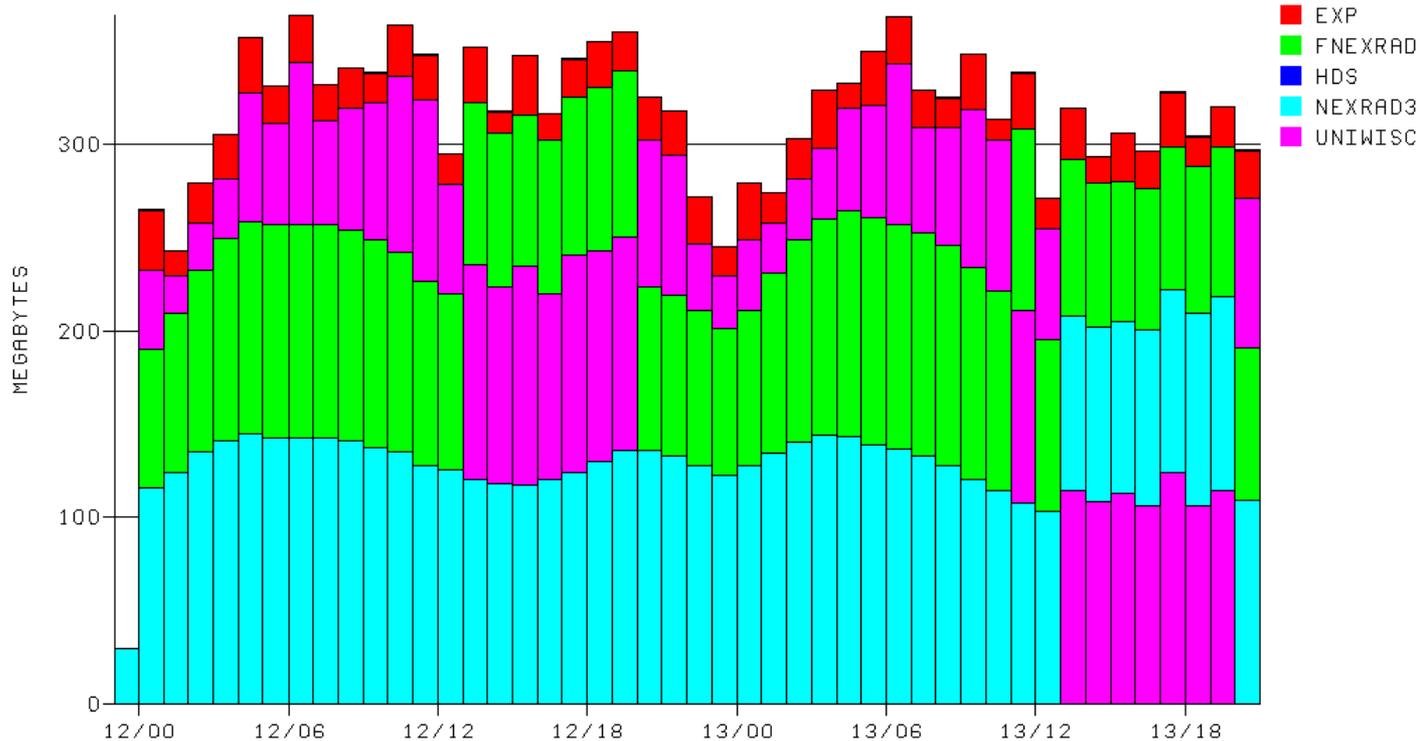
IDD Product Generation and Additional Experimentation

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

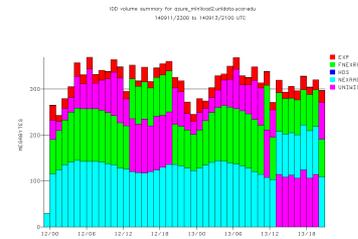
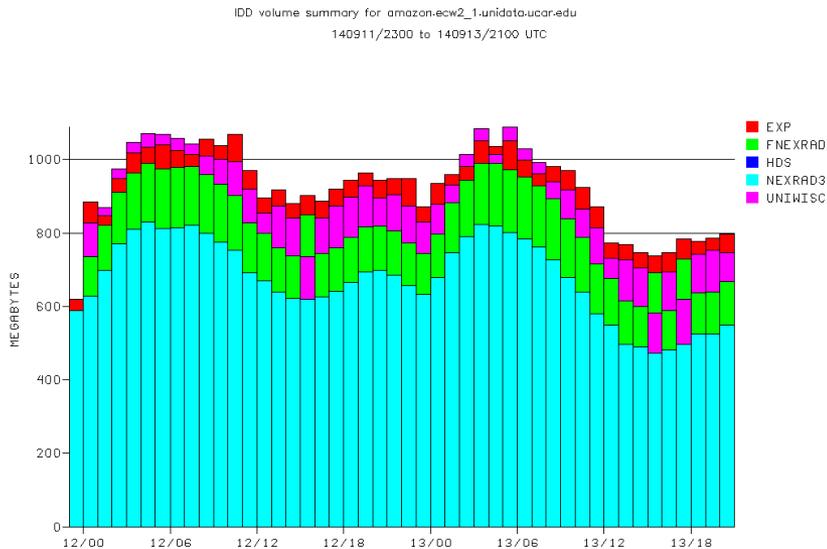


IDD Product Generation and Additional Experimentation

IDD volume summary for azure_miniload2.unidata.ucar.edu
140911/2300 to 140913/2100 UTC



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.

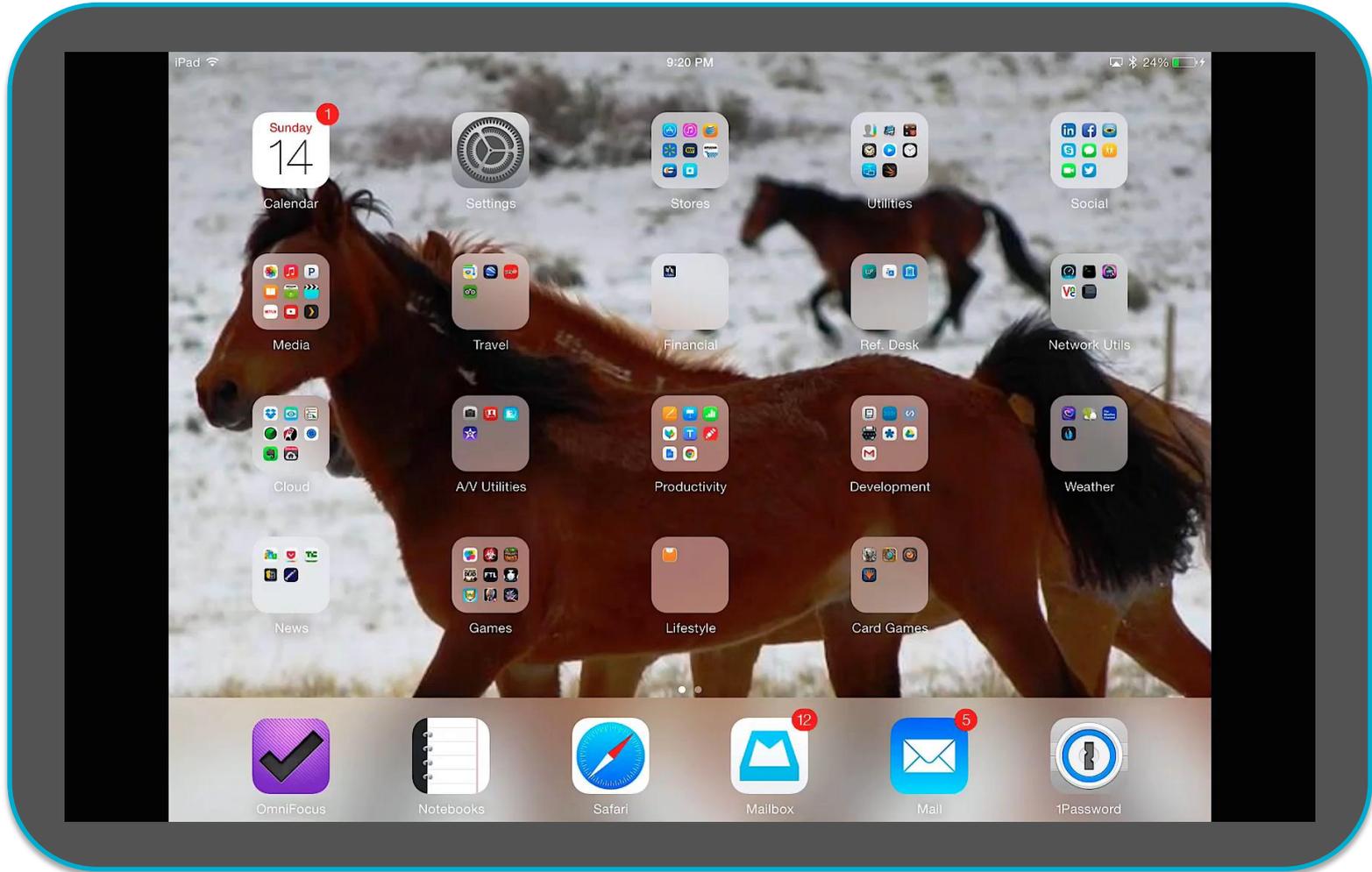
Next Step

- 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.

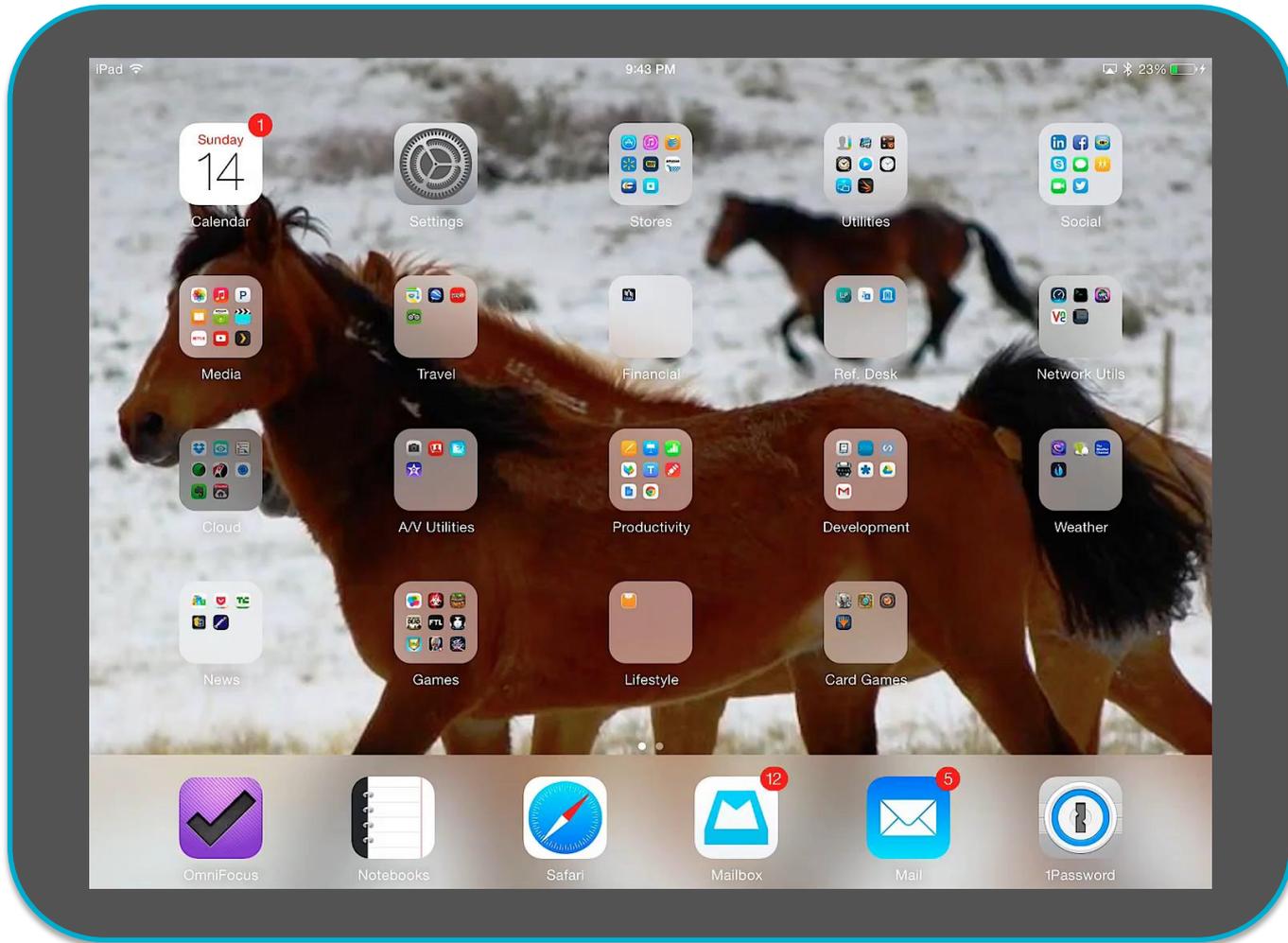
Performance

- 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?