Shapes in the Cloud: Defining Unidata’s Efforts

Strategic Advisory Committee
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Ward Fisher
Goal

• Provide context for the Cloud-related work Unidata is doing.
• Discuss the status of our current ongoing Projects.
Context

• “The Cloud” can have different meanings to different organizations.
• When Unidata talks about ‘The Cloud’, what do we mean?
Using the Cloud

The Cloud for Data Storage
Using the Cloud

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## Using the Cloud

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Uses for the Cloud

- The Cloud for Data Storage
- The Cloud for Data Access and Transport
- The Cloud for Remote Processing
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Harnessing the Cloud

- Existing Unidata Product and Services
- Data Streaming
- Product Generation
Harnessing the Cloud

Existing Unidata Product and Services

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New Unidata Products and Services

- Application Streaming to Mobile Devices
- Cloud-Enabled Unidata Environments.
Ongoing Projects

• AWIPS II Cloud Servers
Ongoing Projects

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• IDD Product Generation and Additional Experimentation
Ongoing Projects

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• “Unidata-in-a-Box” Virtual Environment.
Ongoing Projects

• AWIPS II Cloud Servers
• IDD Product Generation and Additional Experimentation
• “Unidata-in-a-Box” Virtual Environment.
• 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 Product Generation and Additional Experimentation
New Cloud-Enabled Projects

• Unidata-in-a-Box Virtual Environment.
• Integrated Data Viewer (IDV) on mobile devices via Application Streaming.
Unidata-in-a-Box

• This is an effort to provide a VM image pre-configured with Unidata software and services.

Unidata-in-a-Box

LDM
TDS
IDV
GEMPAK
Unidata-in-a-Box

• This will be delivered via cloud services like Vagrant, or through traditional file transfer.
Unidata-in-a-Box

- UiaB can then be deployed within a sandboxed environment on the local PC.
Unidata-in-a-Box

• It can also be deployed back into the Cloud.
Unidata-in-a-Box
Unidata-in-a-Box

• Status: Ongoing
IDV via Application Streaming

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• 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.
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.
Status

• Using the Azure Web API, we are able to dynamically allocate and provision VMs used to host individual IDV instances.
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• 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.
Performance

• How well does it perform?
Performance

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• Performance is tied to the client used.
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• 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.
Parallels Access Demo
Parallels Access Demo
Future Work

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• Moving forward: generic VNC access or dedicated client access?
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• 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).
Internal Tools

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• Binstar: Binary python packages.
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• Binstar: Binary python packages.
• CDash: Dashboard for software testing.
Internal Tools

• Vagrant: Cloud-enabled VM management for developers & scientists.
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  • Git repository: http://github.com/WardF/tiny-ci
Summary

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• Recording an iPad screencast is difficult.
Questions?