Cloud-Integrated IP Design: Bursting EDA Workflows to the Public Cloud

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Agenda

• Why Cloud?

• How Cloud?

• Real-World Example
Why Cloud?
IC Design Complexity is Steadily Increasing

Process nodes shrinks require more design rules and complex DRC analyses

Source: Cadence
Increased Design Complexity Creates Massive Data Sets

Design, Simulation, and Verification processes generate and consume huge amounts of data.

![Capacity requirement by technology node](Source: Dell-EMC)
Infrastructure Needs to “Just Work”

Mindshare allocated towards complex IP and tools...no bandwidth for IT hassles.

Critical EDA IT Requirements

- Scalability
- Performance
- Complexity
Public Cloud Integration offers Best of All Worlds

• Elastic Scalability
  > Resources can scale to match bursty workload requirements

• Unlimited Performance
  > Resources are essentially infinite...capable of high degrees of parallelism

• Minimal Complexity
  > “IT-as-a-Service” abstraction layer eliminates low-level IT headaches
  > No more HW upgrades and maintenance
  > Eliminate restrictive CAPEX commitments
EDA Cloud Bursting Checklist

Scale, Performance, and Simplicity?

Can my tools run in the cloud?

Can I efficiently manage my data?
EDA Cloud Bursting Checklist

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How Cloud?

Ok, so now I want to burst...
EDA Applications were designed for File Systems

Tools expect to create and ingest files and directories

Need data sharing, strict consistency, and performance
Elastically Scalable Compute Resources
Elastically Scalable Compute Resources
Elastically Scalable Compute Resources

ON-PREMISES DATA CENTER A

CLOUD SERVICE PROVIDER A

ACTIVE DATA

ON-PREMISES FILE SYSTEM

Cädence Synopsis Mentor Other Tools and Scripts

Object Storage
Elastically Scalable Compute Resources
Elastically Scalable Compute Resources
EDA Cloud Bursting Checklist

Scale, Performance, and Simplicity?  ✔

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- Elastifile
- CloudConnect

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Elastifile

Confidential
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Can I efficiently manage my data?  ✔
Real-World Example
Bursting Parasitic Extraction to the Public Cloud

IP design firm leverages Elastifile and Google Cloud Platform to maximize verification efficiency

Challenge

Need to offload memory-intensive parasitic extraction jobs
Need to support high-performance, parallel analysis of large data sets
Need to run Synopsys StarRC in-cloud, without refactoring
Need to align IT costs with bursty workload demands

Solution

Elastifile and Google Cloud Platform for elasticity, performance, and cost-effectiveness
Google Cloud Platform for scalable Compute...Elastifile for scalable Storage
Elastifile POSIX file system supports existing EDA tools, with no changes required
Cost-effective, elastic solution...Spin up Elastifile and GCP Compute only when needed
A Real-World, Cloud-Integrated EDA Solution

Parasitic Extraction Jobs

Job Scheduler

Parallel Compute

Distributed File Storage

Cloud Instance

Google Cloud Platform

elastifile

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HIGH PASS

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Elastifile: Enabling Cloud-Integrated EDA

*Burst to cloud to expand resources or offload on-premises infrastructure*

Delivering cloud application compatibility

Delivering in-cloud data management

Delivering hybrid cloud data mobility
Free Your Data, Free Your Business

THANK YOU!

elastifile
Cross-Cloud Data Fabric