



# Flash-Based Cache Protection Modules using Ultracapacitors

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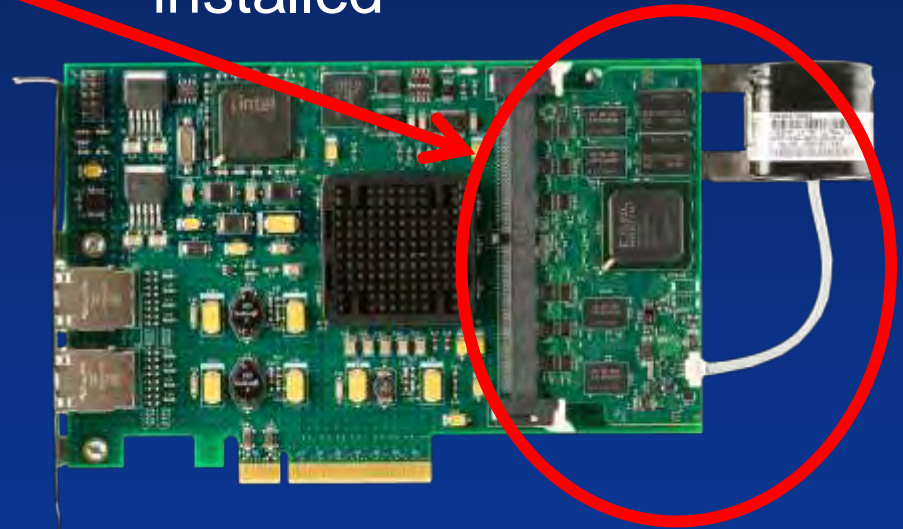
# Agenda

- The “What & Where” of Cache Protection Modules
- System Challenge Today
- Solution & Performance
- Technology & Cost Comparison
- Conclusion

# Where Cache Modules Fit

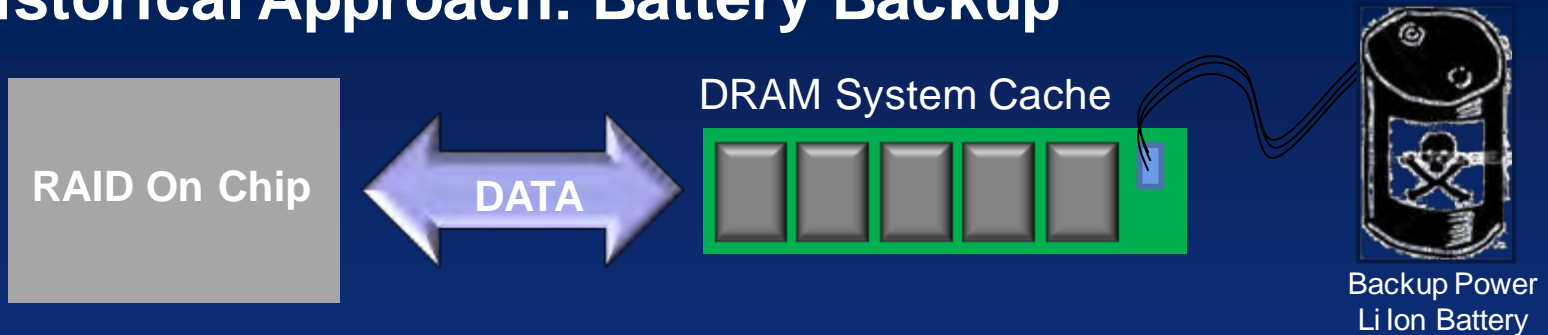


- RAID Controller Card with Cache Module installed



**Rack Server**

## Historical Approach: Battery Backup

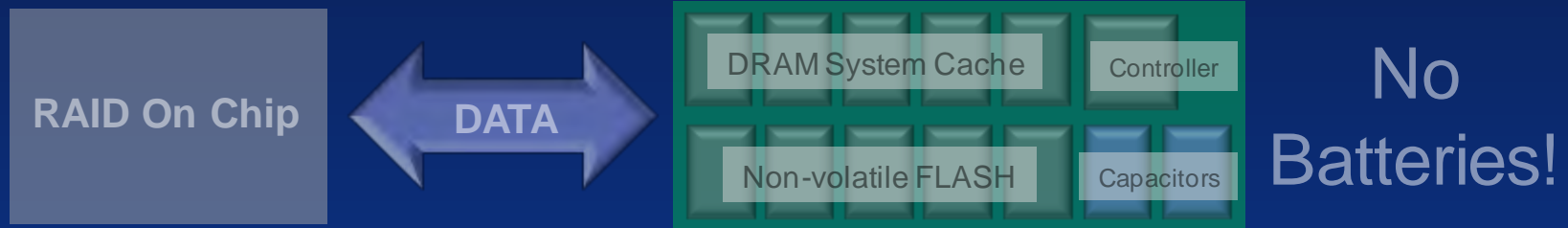


- Rethinking cache protection architecture to:
  - Preserve cache indefinitely during power failure
  - Eliminate battery
  - Reduce maintenance & battery replacement costs
  - Become environmentally friendly

# New Architecture

## Advanced Solution: Flash Backup using Ultracapacitors

NetVault™ NV – Cache to FLASH



Item	Flash w/ Ultracapacitors	Battery
Data retention	10 years	24 – 96 hours
Replacement costs	None	Annual costs (~\$70 – \$80)
OEM support	No truck rolls or techs needed	Truck rolls & tech time (~\$200 – \$1000 / roll)
Environmentally Friendly	Yes, RoHS 6/6 compliant	No

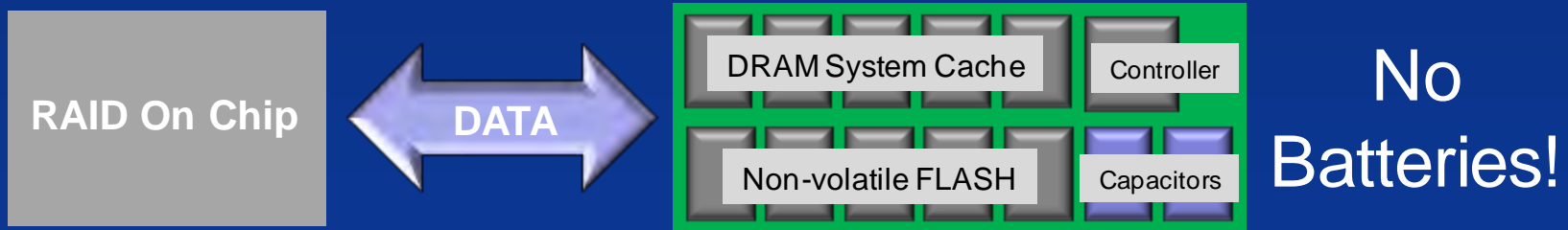
# Batteries BAD...

## Historical Approach: Battery Backup



## Advanced Solution: Flash Backup using Ultracapacitors

### NetVault™ NV – Cache to FLASH



# NetVault Flash-based, Battery-Free Cache Solution!



## Benefits:

- No truck rolls or battery replacements
- No battery disposal costs
- No server performance hit (IOPS)
- No unnecessary planned or unplanned downtime



**Estimated  
Savings:  
over \$550 per  
system**

## No tragic battery stories to tell!



# THANK YOU

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