

# **Economics of Public Cloud Storage:**

## **For primary storage and disaster sites**

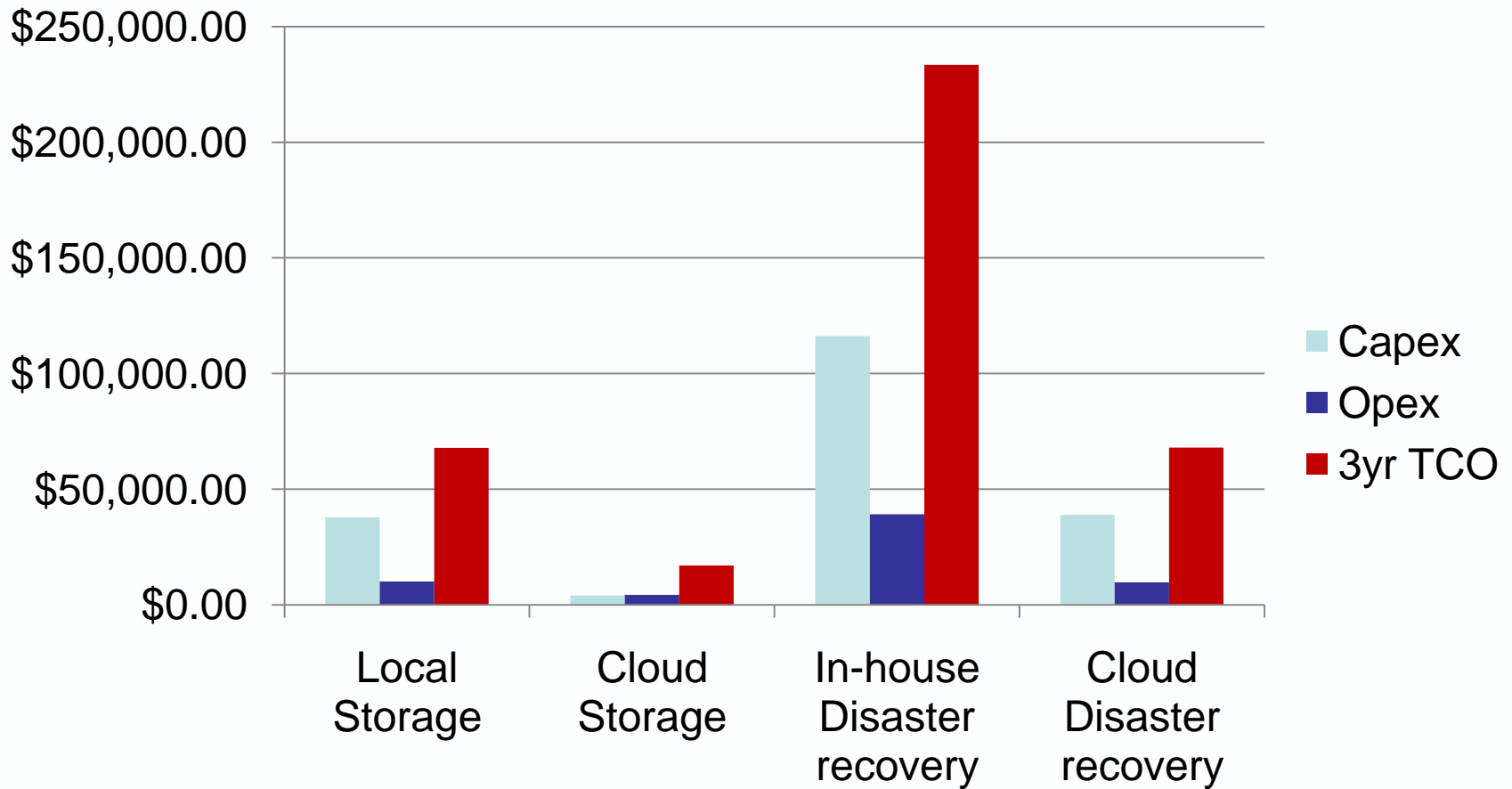
November 2009

# Comparison

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- Compare total cost of ownership (TCO) of cloud storage versus local storage
  - Capital and Operating expenses, ignoring local site floor/power/cooling costs
- Calculate 3-yr TCO across the following storage use cases
  - Primary storage tier
    - Local storage array, local tape backup –versus-
    - CloudArray™ storage gateway, cloud storage, snapshot-based backup
  - Offsite replicated storage tier for disaster recovery
    - Local storage array with remote replicated disaster site –versus-
    - Local storage array with CloudArray™ cloud-hosted disaster site
- Observe TCO as capacity increases
  - Start with 1TB baseline
  - Compare across fixed size X TB storage configurations
  - Compare across linearly growing 0-X TB storage configurations

# Baseline: 1TB storage capacity



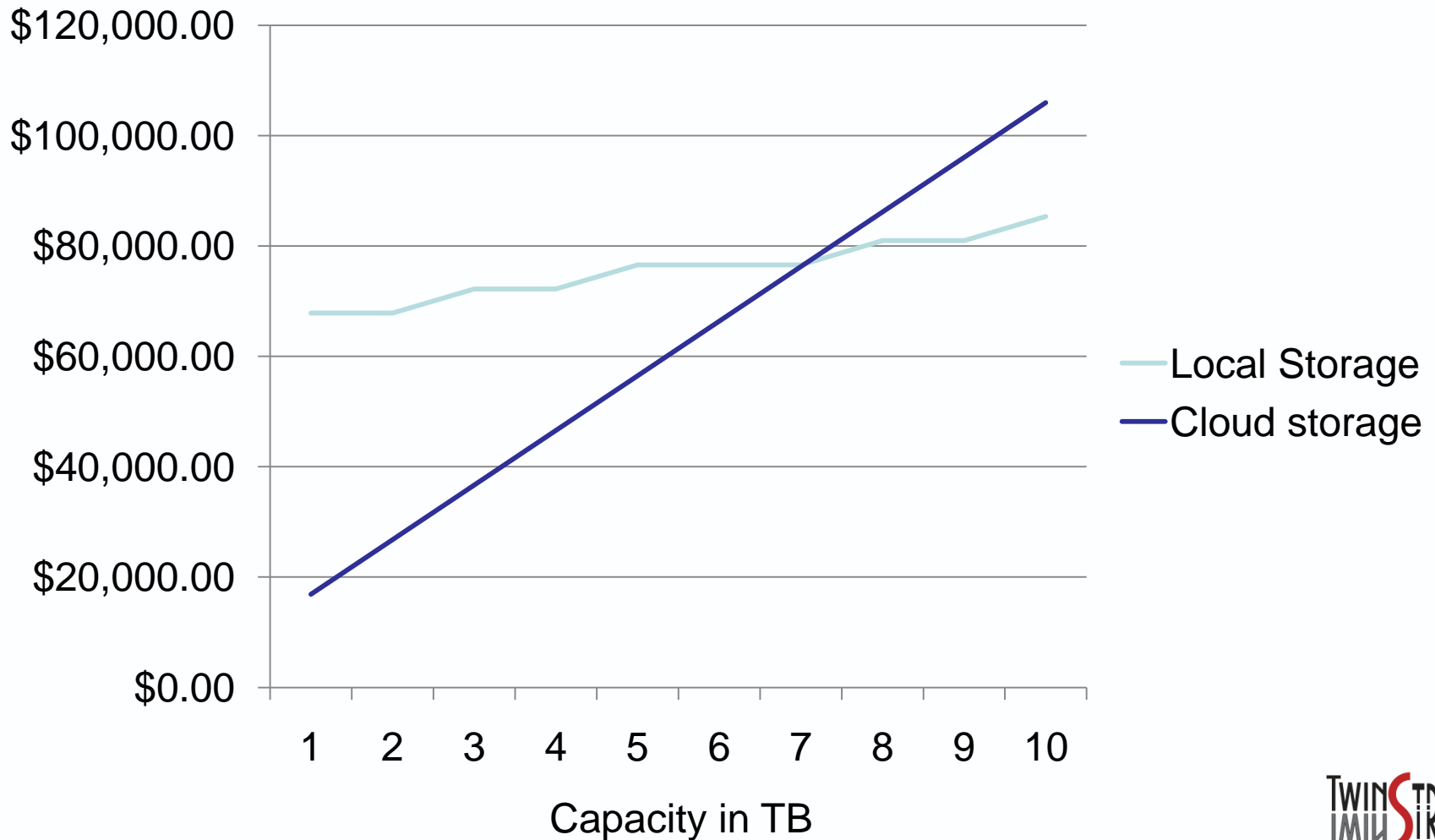
Primary storage tier

Offsite replicated storage tier



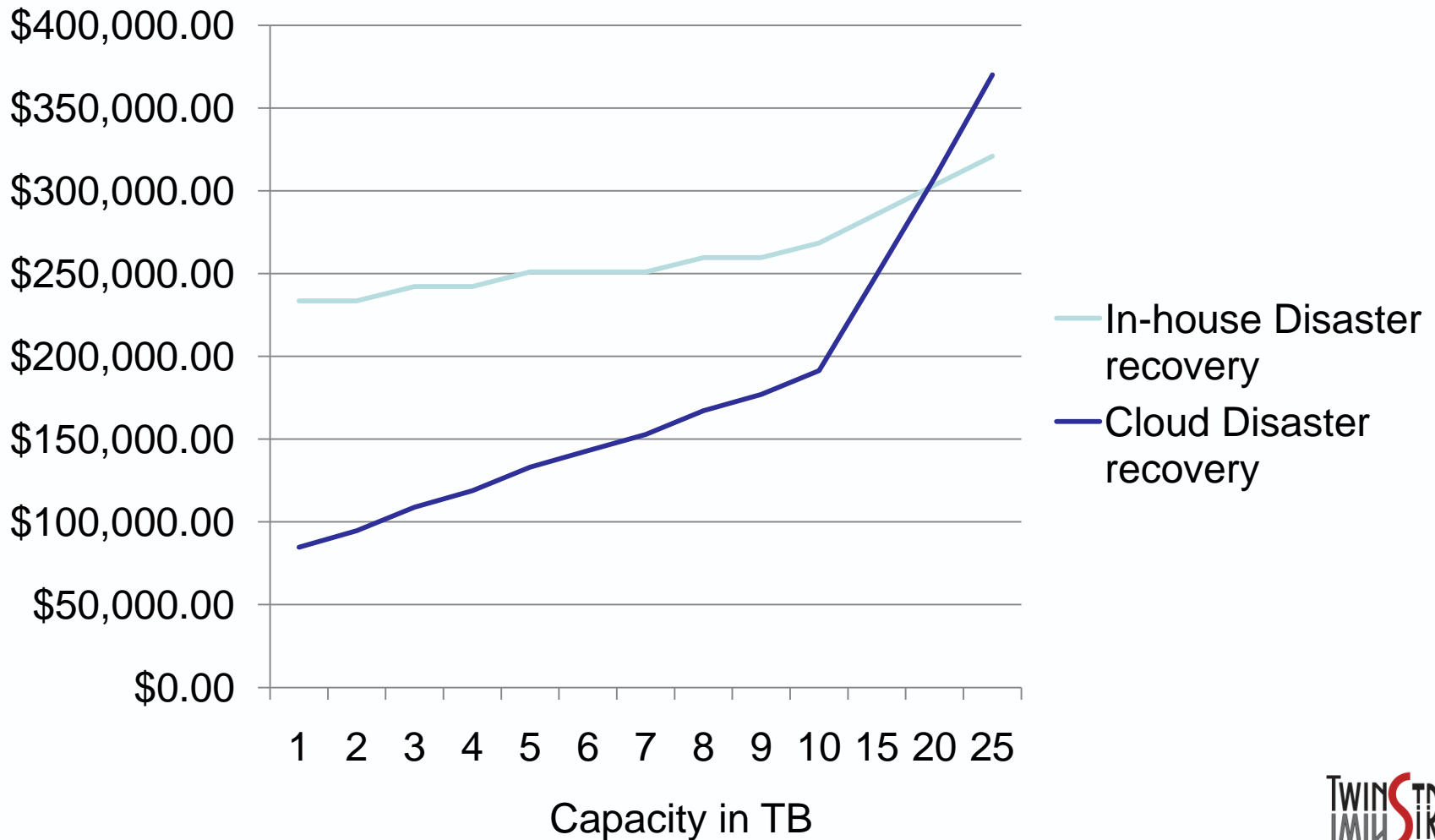
# 3-yr TCO:

## Fixed capacity, primary storage



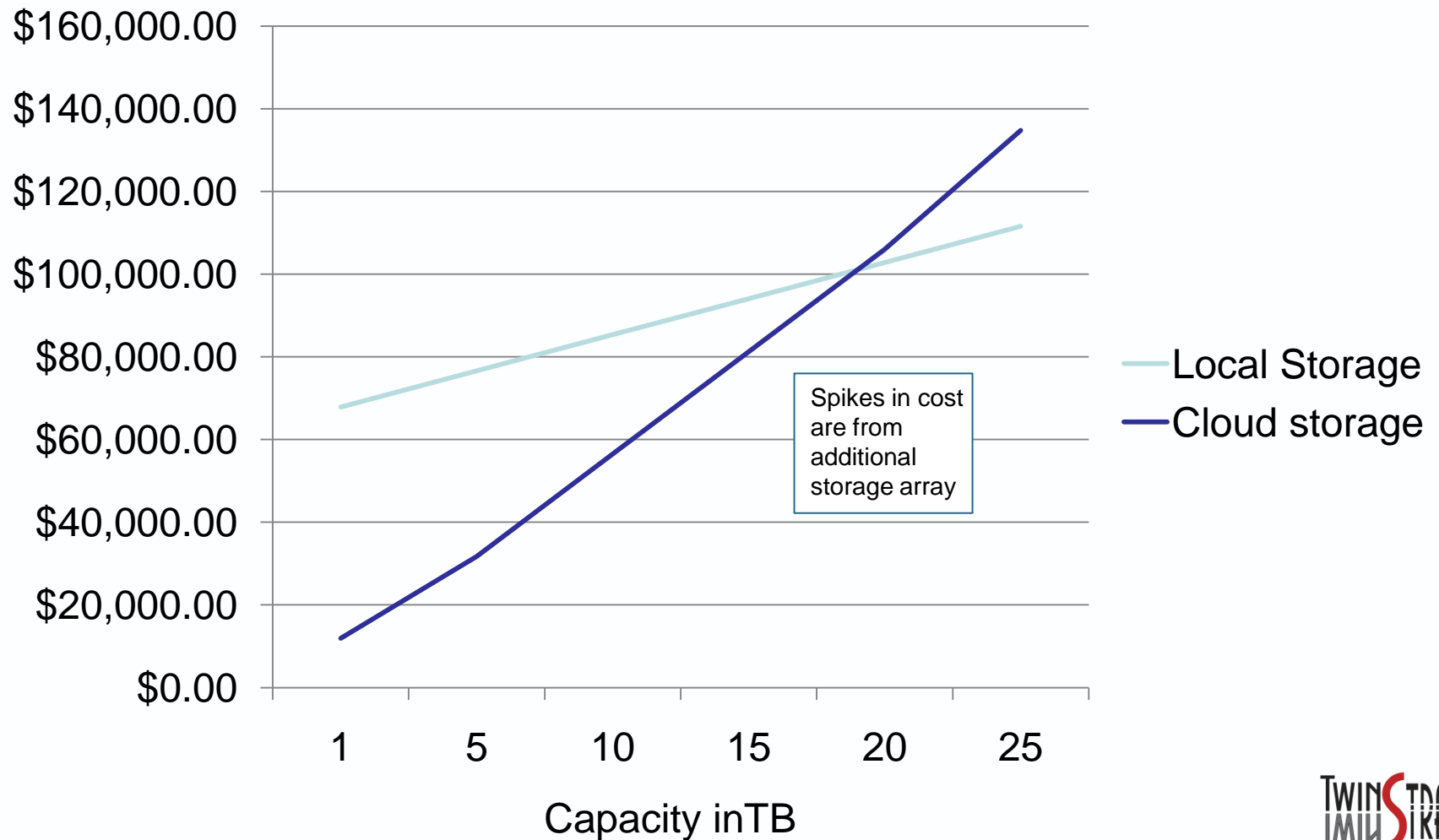
# 3-yr TCO:

## Fixed capacity, offsite storage



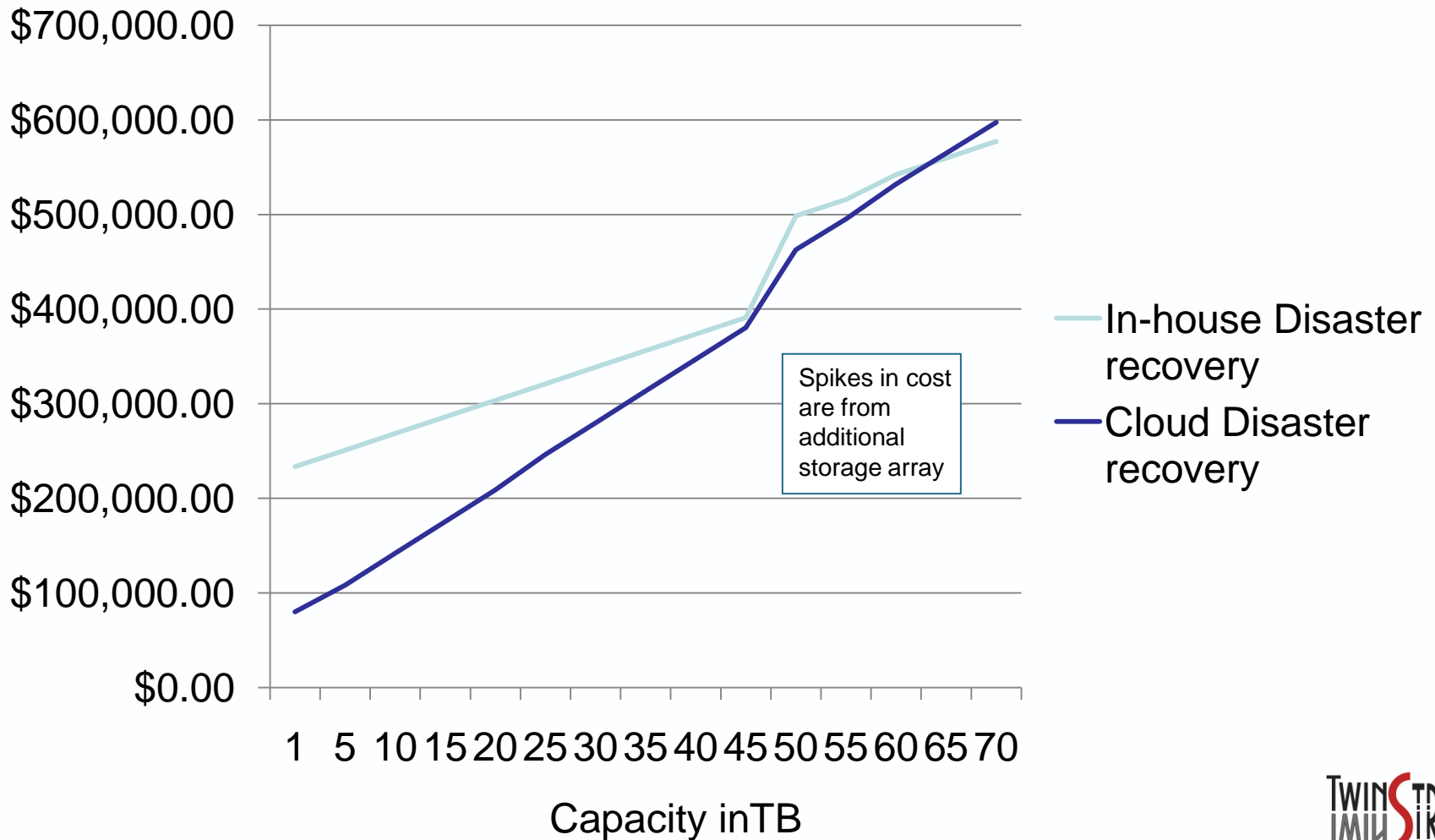
# 3-yr TCO:

## Growing capacity, primary storage

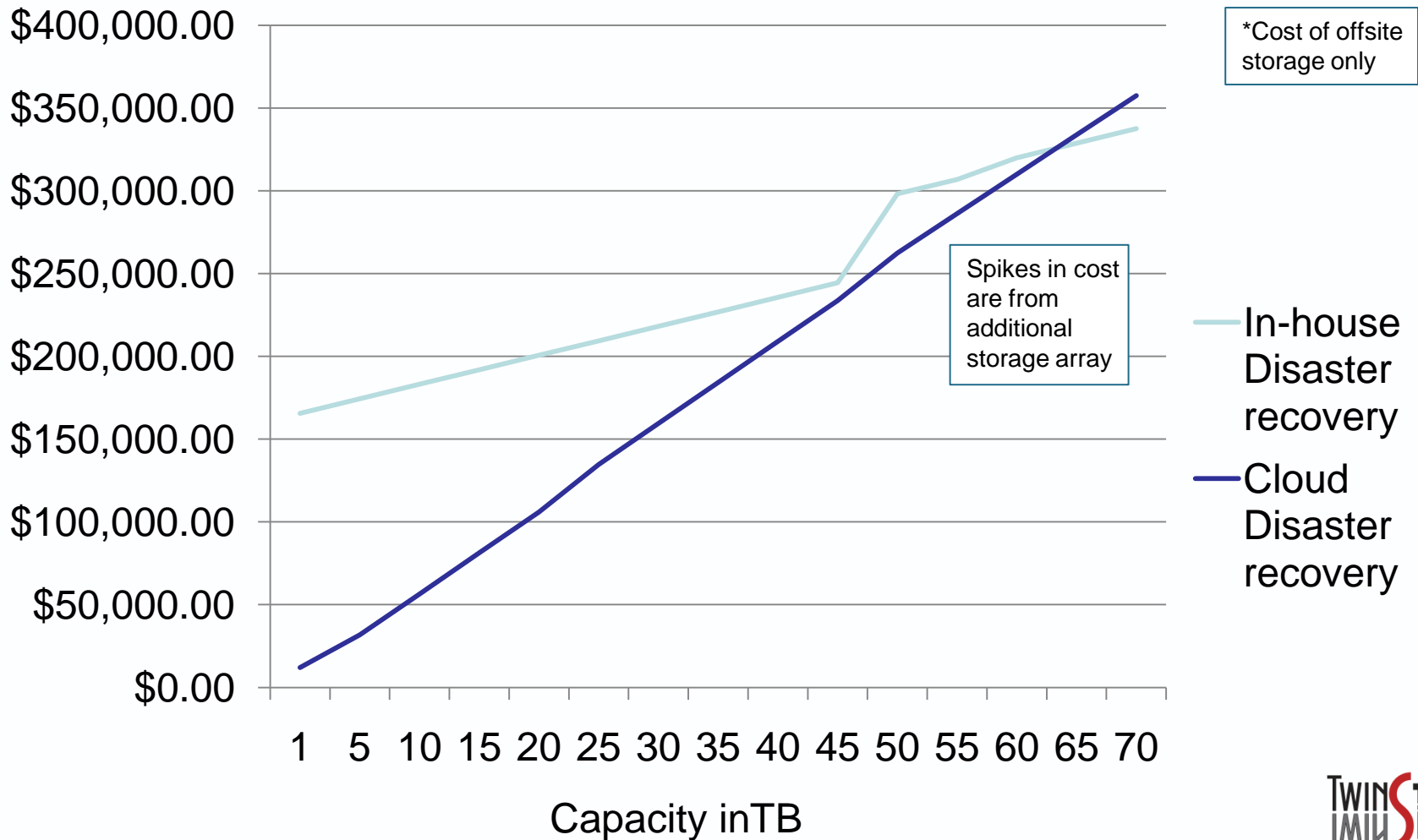


# 3-yr TCO:

## Growing capacity, offsite storage



# 3-yr incremental cost\*: Offsite storage, in-house vs. cloud



# Results

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- Small capacities (~1TB)
  - Cloud storage appears considerably less expensive than local
  - Storage arrays do not scale down to a true pay-as-you-go model
- For fixed storage capacities
  - Cloud storage less expensive up to about 7TB for primary storage and 20TB for offsite storage
  - Cloud saves significantly on the remote site infrastructure needed for an offsite copy of data
- Linearly growing storage capacities
  - Crossover point advances to 20TB for primary storage and 60TB for offsite storage
  - Cloud benefits from a pay as you go, 100% utilized model, versus a pay up front, underutilized model.
- All results based on model assumptions and may vary across configurations

# Model Cost Assumptions

## Local Storage

Local storage array	\$30,000.00
Local tape library	\$3,400.00
Local storage base capex	\$33,400.00
# of drives per RAID set	5
cost per drive	\$875.00
capacity per drive (GB)	600
RAID set capacity(TB)	2.40
RAID set cost	\$4,375.00
RAID opex (annual)	\$5,000.00 (maintenance and administrative cost)
Backup opex (annual)	\$5,023.05 (maintenance and administrative cost)
Storage array capacity (TB)	45.60
Local power/cooling/floor space	<i>not factored for this study</i>

## Cloud Storage

Cloudarray base license	\$4,000.00	max cap TB25
Capacity cost per TB/mo	\$150.00	\$140.00
Bandwidth cost per TB/mo	\$100.00 (assuming 100% update rate/mo)	
Additional capacity for snapshots	10.00%	
3yr capacity total cost per TB	\$9,900.00	\$9,504.00
Cloud opex base	1,000.00	

## Cloud Provider Cost

	0-50TB	50-100TB
capacity cost per GB/mo	\$0.15	\$0.14
bandwidth cost per GB/mo	\$0.10	\$0.10

## In-house DR to remote site

In-house DR base capex	\$107,400.00 (2X storage array, \$20K remote lab infrastructure + \$25K replication license)
RAID set cost	\$8,750.00 (2X capacity)
Remote site annual operating costs	\$24,114.00 (space, power, cooling, multi-site management, network)



# Additional resources

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- Clarity AP used to model baseline configuration
  - Free download from [www.twinstrata.com](http://www.twinstrata.com)
  - Download configuration file from Clarity AP portal: cloudROI - local.cyr
  - Change parameters to model your exact configuration

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**Thank You**