Moving VMs Across the WAN with Unprecedented Performance Improvements

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Virtualization Challenges n=450

4. What are the key challenges in your virtualization environment? (Choose all that apply) Actions

Too many agents in my virtual machines	51	12%
CPU overload while backing up	50	12%
Backups take too long	60	14%
Backup complexity	117	28%
Recovery takes too long	30	7%
Network performance	113	27%
Storage complexity	142	34%
Storage cost	161	39%
Anti-virus scanning and scheduling	50	12%
Patch management and distribution	93	22%
Log capture and analytics	55	13%
Moving virtual machines over the WAN	80	19%
Other, please specify View Responses	55	13%

Why Move VMs Over the WAN?

- Disaster Recovery
  - Ability to move VM's rapidly between sites is fundamental
- Configuration Management
  - Configuring VMs in the datacenter and pushing them to a ROBO
- Cloud
  - Taking advantage of the emerging Cloud Storage and Private Cloud Resource offerings
- Backup
  - Offsite retention is critical

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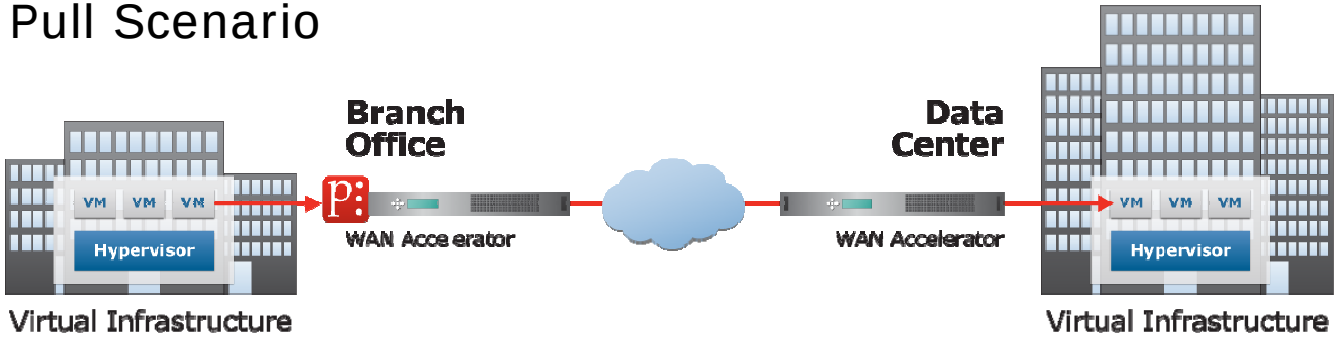
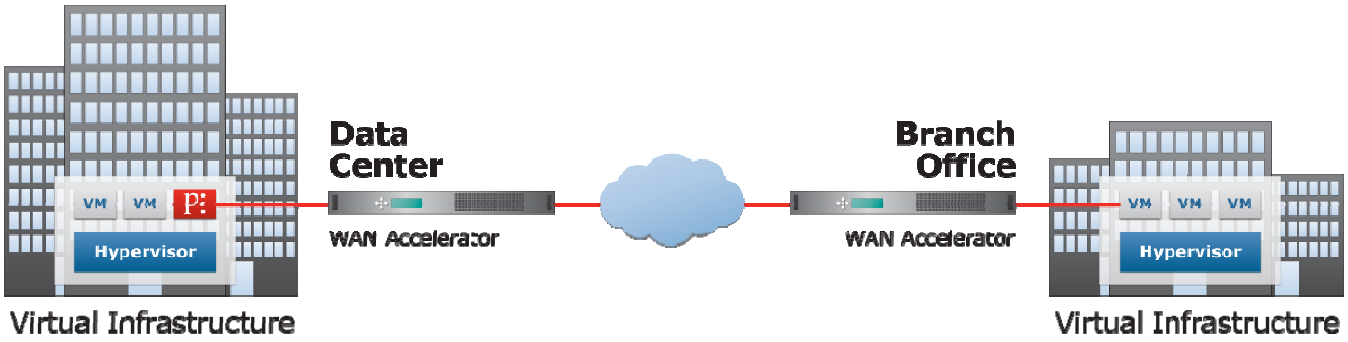
WAN Accelerator + I/O Optimization

Pull Scenario



Branch Office WAN Accelerator with VMs being "pulled" from the Branch Office to the Data Center for central backup or maintenance.

Push Scenario



Data Center with VMs being "pushed" from the Data Center to the Branch or Private Cloud Provider

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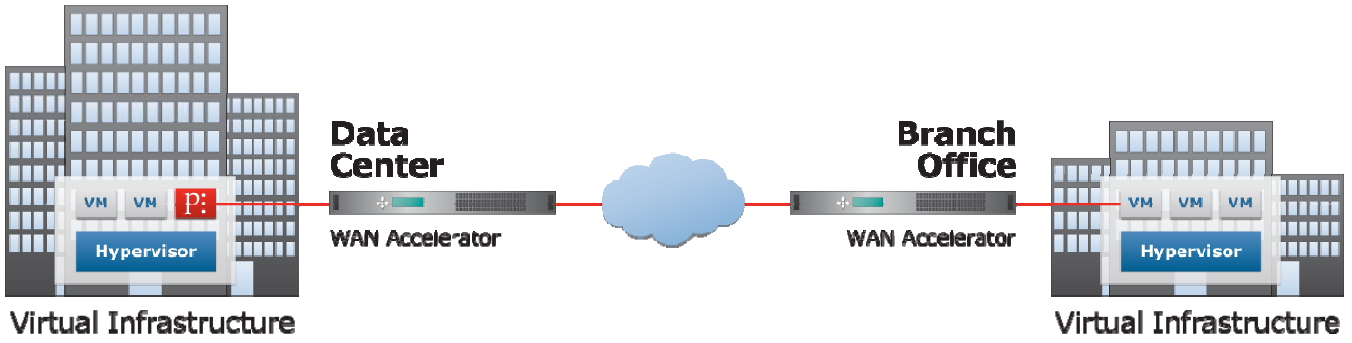
Provision and Backup VMs in a Hybrid Cloud

- Increase VM Migration speeds by 10x
- Without using proprietary tools
- Without proprietary storage hardware
- From source and target storage devices on different networks



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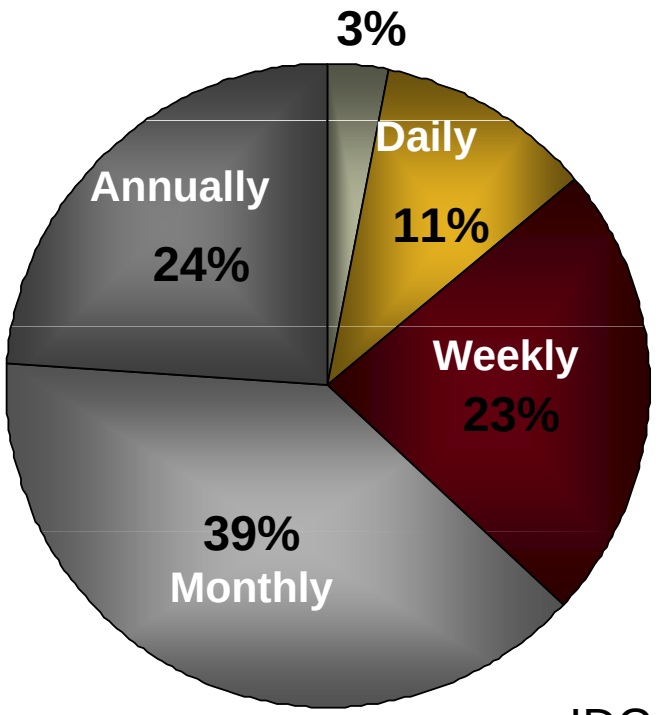
VM Movement Frequency

- Less than 15% of VMs move daily
- Why not?



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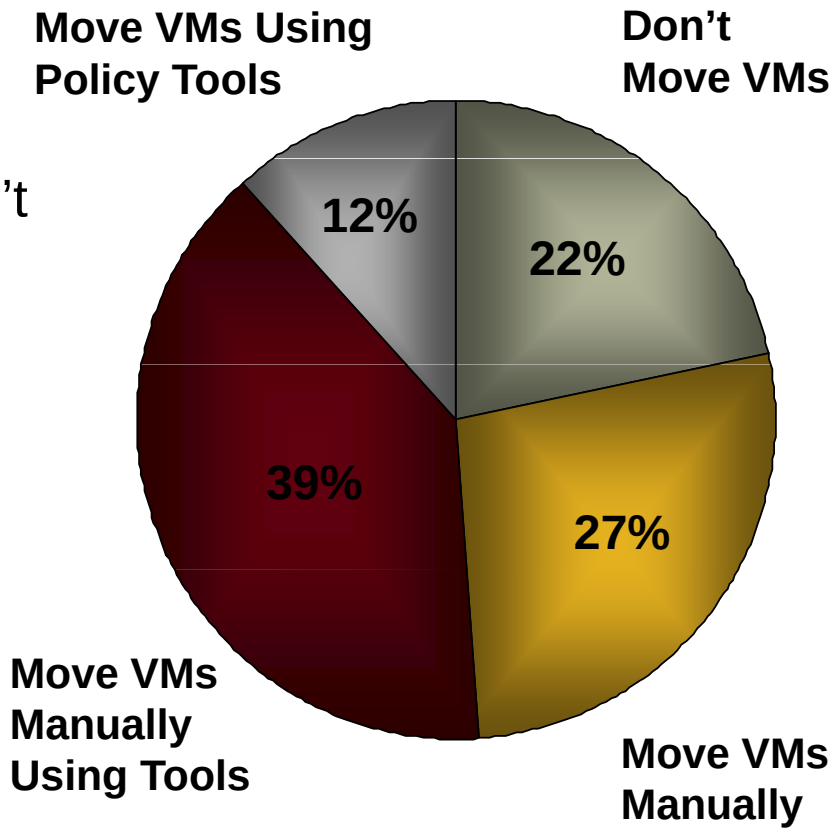
Virtualization Machine Movement

Mobility is on the Rise

VM Mobility Management

- VMs are moving, but not far enough…
  - Existing protocols don't compress (SSL, SCP)
  - Manual processes breaking down
  - WAN tools are expensive and complex



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Solution Components

- Use compression for common protocols
  - CIFS, NFS...
- Optimize the data stream
  - Minimize the I/O required
- Optimize for block level changes
  - No need to send the same block twice
- Minimize the impact
  - Hypervisor, Network and Storage are all affected

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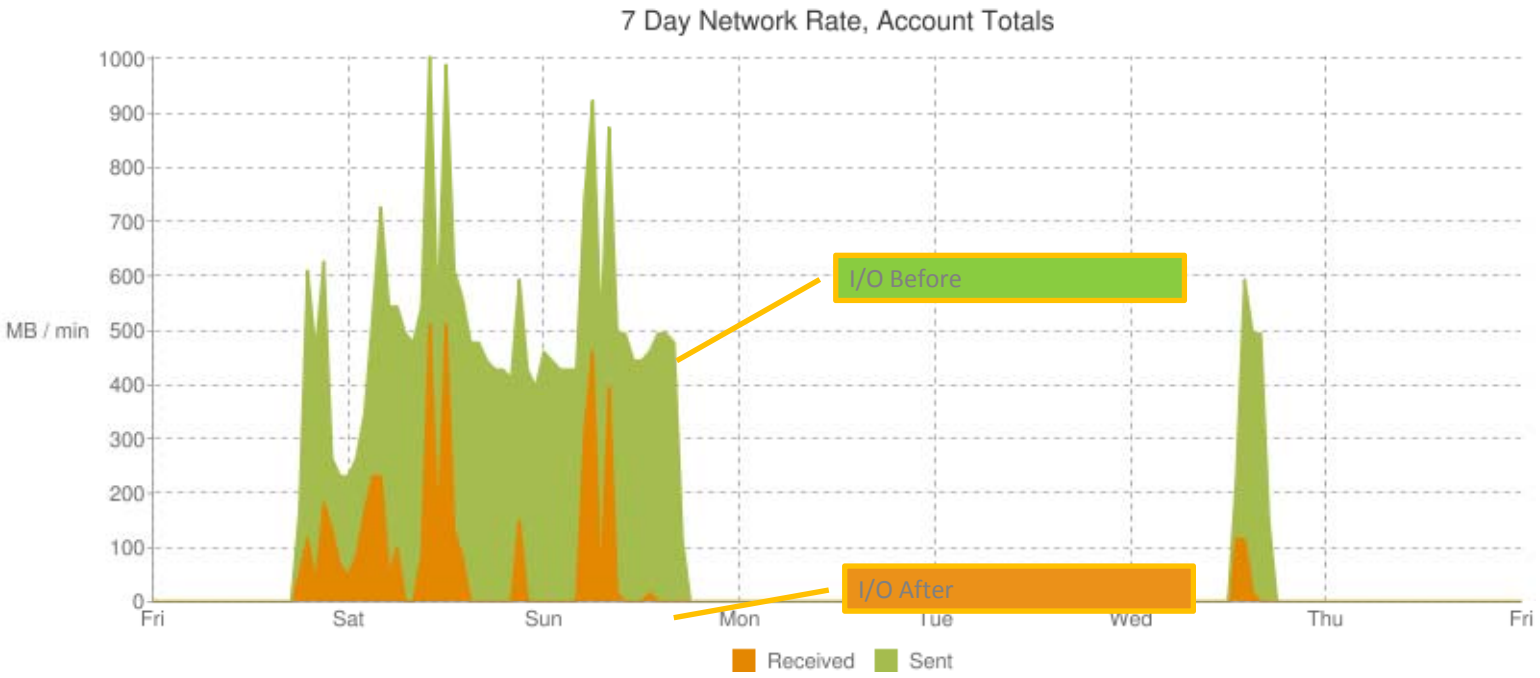
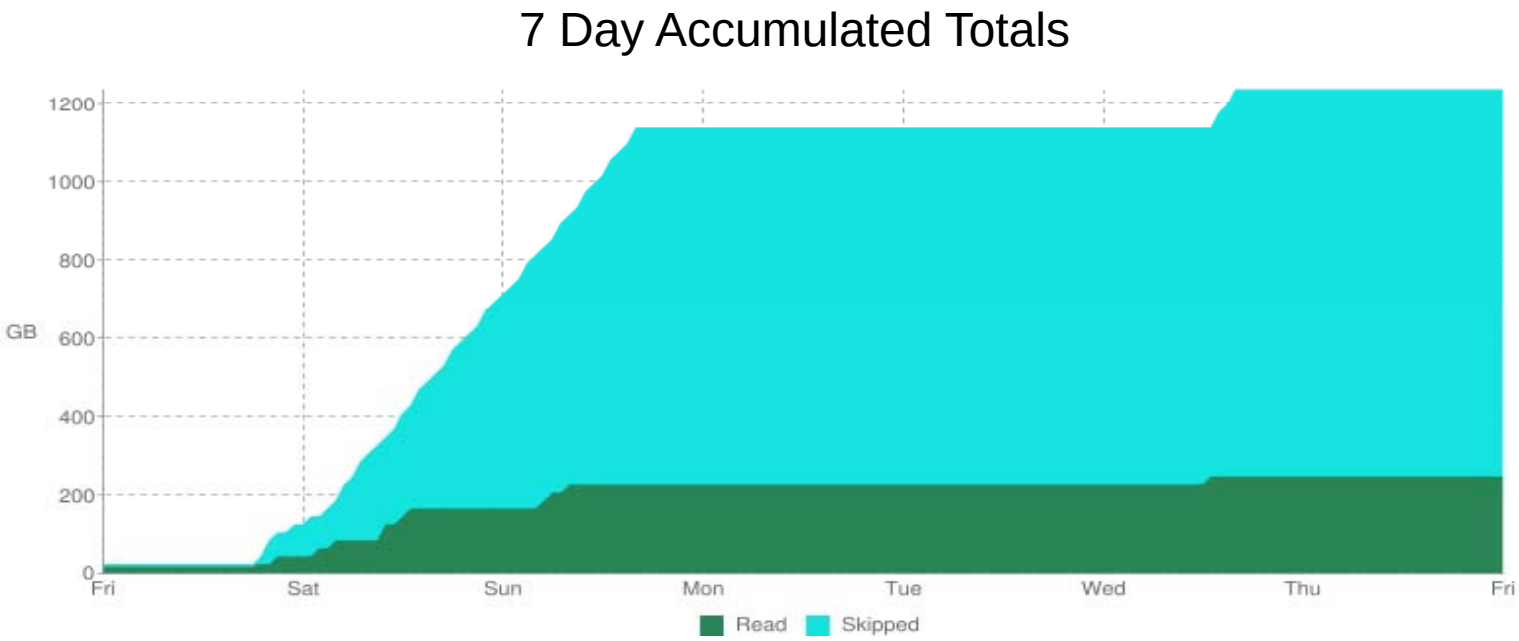
SmartRead in Action
Reduce the I/O



Reduced I/O

- Add up over time
- Especially with change block tracking



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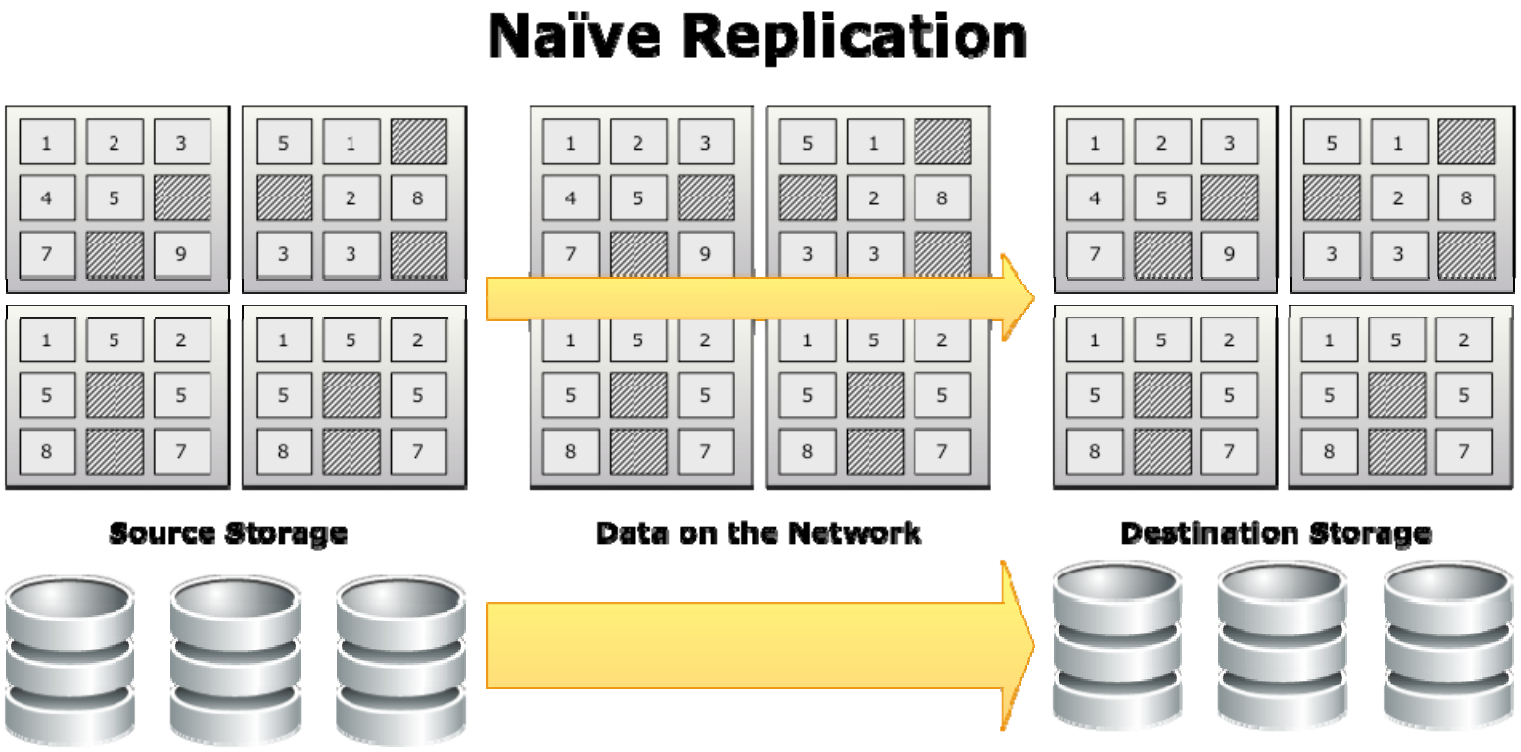
Native Replication Isn't Pretty



100% data movement.

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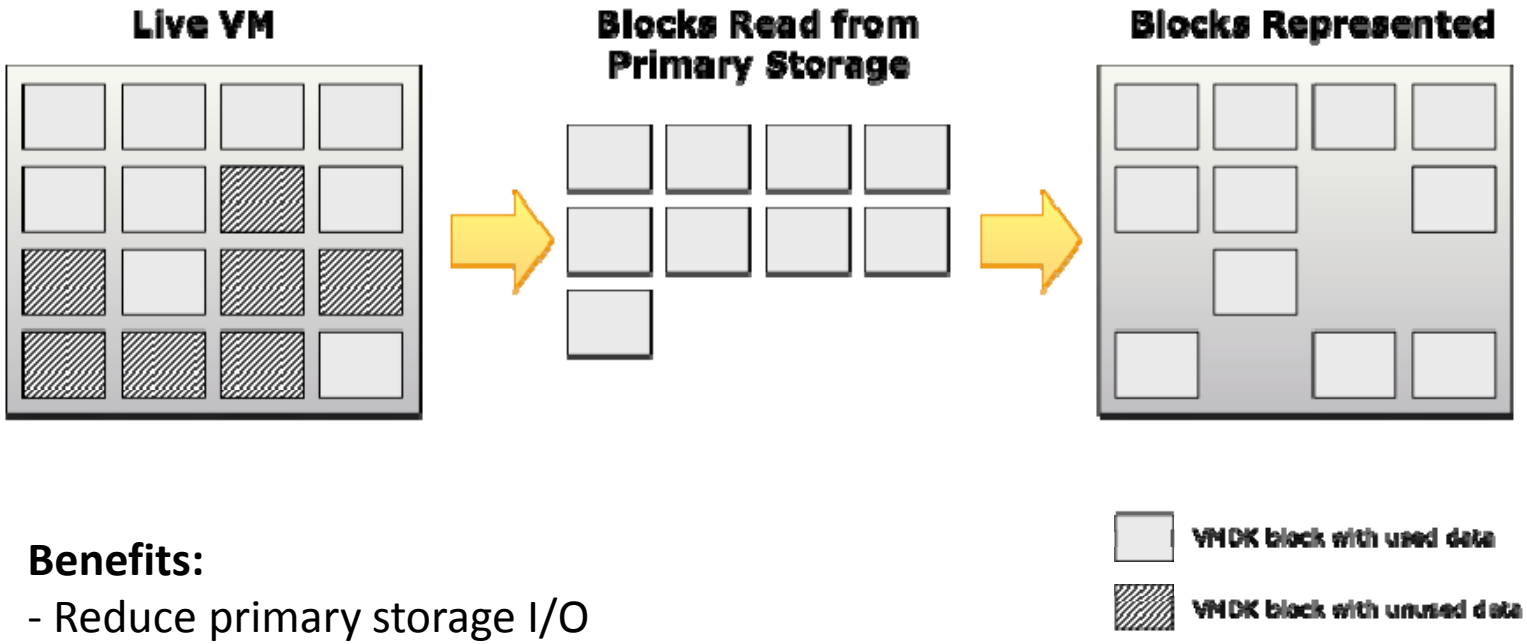
Just Move In-Use-Blocks



Benefits:

- Reduce primary storage I/O
- Reduce data movement / faster copy
- Better compression / dedupe on target

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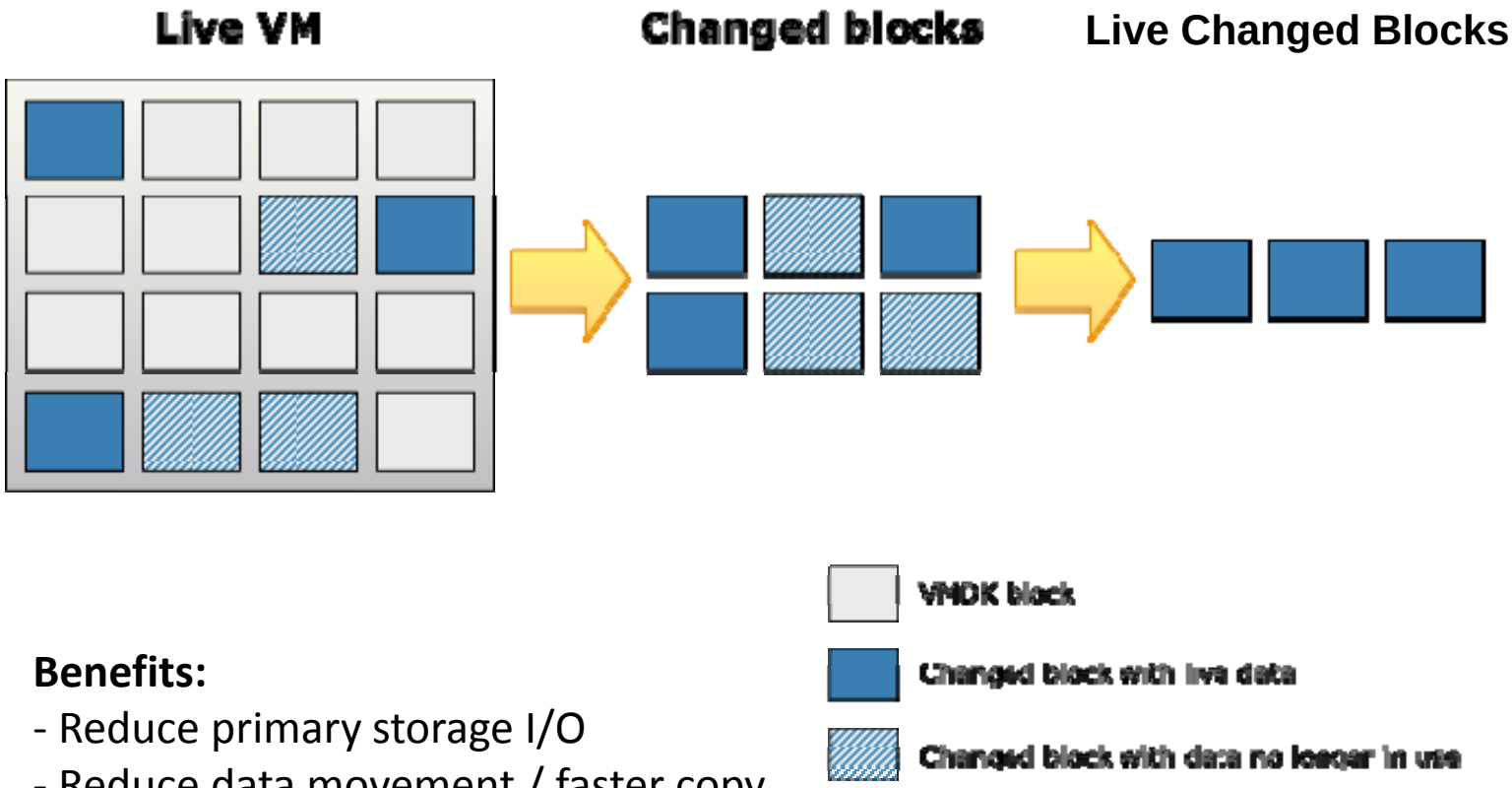
Extend to Live Changed Blocks



Benefits:

- Reduce primary storage I/O
- Reduce data movement / faster copy
- Image copy at the cost of an incremental

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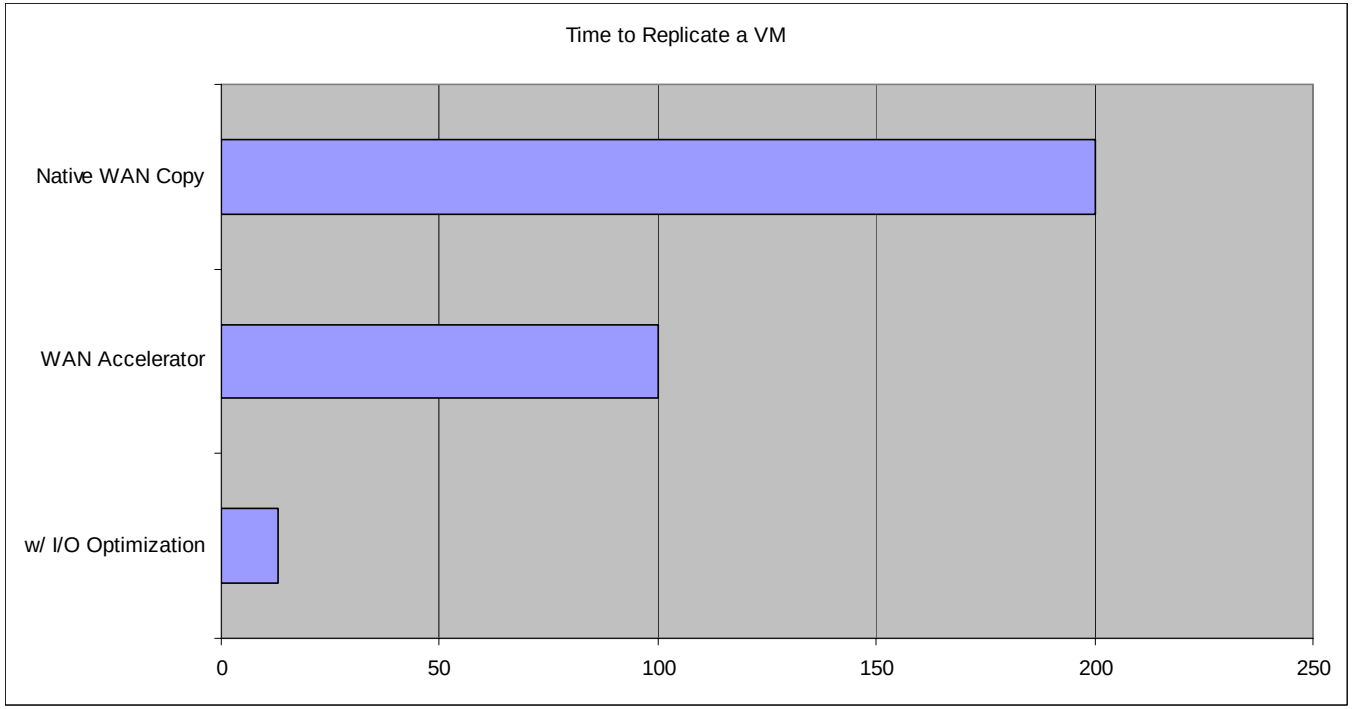
Put It All Together Now…

- The Results:
- **95% reduction** of the time it takes to move a VM across a WAN
  - 200 to 13 minutes (8 Gb VM,10 Mbps link, 140ms roundtrip latency)

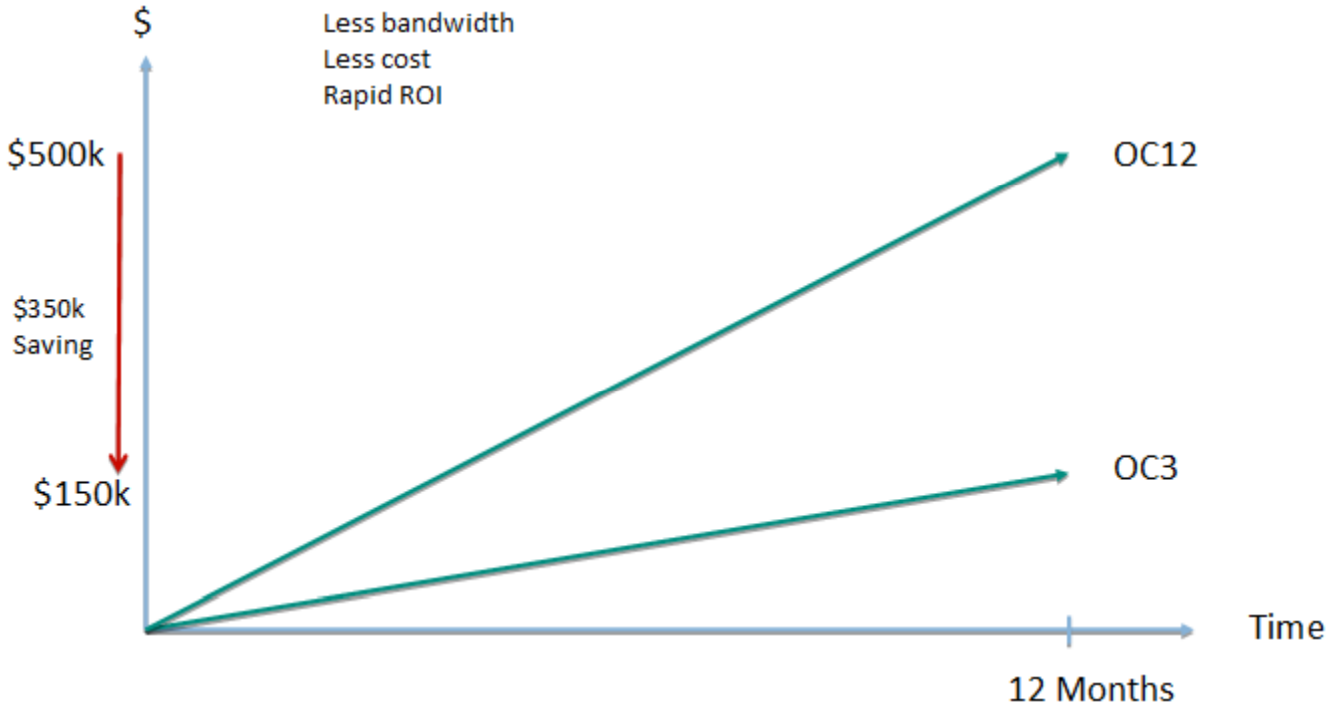


Transfer times

Transfer times in minutes of a 20 GB VM with Windows 2003 Server Image achieving 90% compression.

Internet Link	T1	Test	T3	OC1	OC3
Mbps	1.5	10	44	52	155
Native Transfer	2222	333	76	64	22
Optimized Transfer	222	33	8	6	2
US average price per dedicated line per month	$120	$800	$3.520	$4.160	$12.400

I/O Reduction + WAN Accelerator Performs Better on a OC3 than a Native OC12 Link



Questions?

- Considerations
  - VMs facilitate new approaches to server mobility
  - Heterogeneous is good
  - “Think outside the bun!”

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