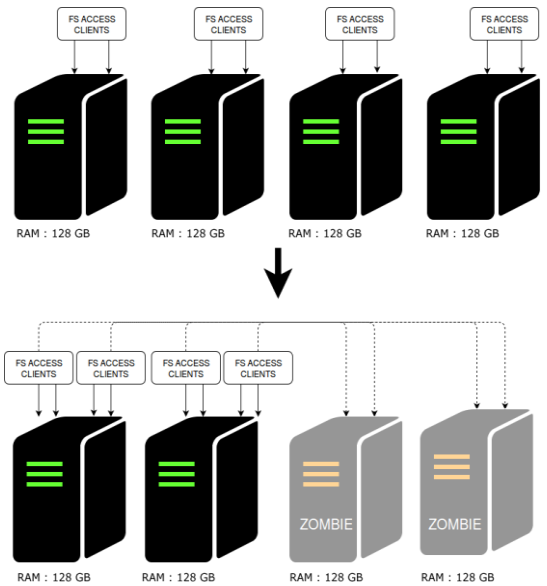
CLOUD

ZombieSwap: make data centers more energy efficient

Cloud data centers operate at low utilization rates resulting in significant energy waste. VM consolidation allows to put some servers in sleep mode (low energy), but in practical it is quickly limited by the available memory of active servers.

DESCRIPTION*

- ZombieSwap lets the cloud virtualization platform exploit available memory in suspended servers as reservoir devices
- For a given QoS objective, fewer active servers are needed
- ZombieSwap software manages RAM allocation between servers
- Requires an adapted server hardware to provide RDMA access to the RAM of suspended servers
- Impact on network traffic is limited
- Current implementation is a low-level simulator based on real-world data center traces



Cache miss rate
Disk access time
Latency

1200W

640W

*Cache miss rate: **stable***
*Disk access time: **stable***
*Latency: **stable***
*Network impact: **low***

TECHNICAL SPECIFICATIONS

Server	Adapted hardware to preserve access to RAM even if server is in low-power mode
Network interface	RDMA compatible
Server network	Low latency network (InfiniBand, etc.)

COMPETITIVE ADVANTAGES

- Significant energy saving
- Exploit suspended servers as reservoir devices
- Low network impact

APPLICATIONS

- Data centers
- HPC

INTELLECTUAL PROPERTY

- Patent, Software

DEVELOPMENT STAGE

- Experimental proof of concept

1 2 **3** 4 5 6 7 8 9

LABORATORIES

- SEPIA team

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