SUSE® Linux Enterprise High Availability

Reliable Availability for a Reliable Platform

Kai Dupke
Senior Product Manager
SUSE Linux Enterprise Server
kdupke@suse.com

Mike Friesenegger
Systems Engineer
mfriesenegger@suse.com

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Topics

SUSE® Linux Enterprise High Availability

- The Challenge
- Overview
- Roadmap & Feature Comparison
- Service Pack 2
- Demo
- Geo Cluster
- Architecture

Challenge

Challenge

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Murphy's Law is Universal

- Faults will occur
  - Hardware crash, flood, fire, power outage, earthquake?
- Can you afford a service outage or worse, loss of data?
  - You might afford a five second blip, but can you afford a longer outage?
- How much does downtime cost?

Can you afford low availability systems?

Overview

Benefits

SUSE® Linux Enterprise High Availability

- Quickly and easily install, configure and manage clustered Linux servers
- Ensure continuous access to your mission-critical systems and data
- Transparent to Virtualization – nodes can be virtual or physical
- Meet your Service Level Agreements
- Increase service availability

Overview

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- Service availability 24/7
  - Policy driven clustering
- Shared and Scaled data-access
  - Cluster file system
  - Clustered Samba
- Scale network services
  - IP load-balancing
- Virtualization Agnostic
  - Platform independent setup
- Disaster tolerance
  - Data replication via IP
  - Node recovery
- User friendly tools
  - Graphical user interface
  - Unified command line interface
- Geo Clustering
  - Cluster across unlimited distance
- Free Resource Agents

Key Use Cases

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- High availability for mission-critical services
- Active/active services
  - OCFS2, Databases, Samba File Servers
- Active/passive service fail-over
  - Traditional databases, SAP setups, regular services
- Private Cloud
  - HA, automation and orchestration for managed VMs
- High availability across guests
  - Fine granular monitoring and HA on top of virtualization
- Remote clustering
  - Local, Metro, and Geographical area clusters

Key Use Cases SAP

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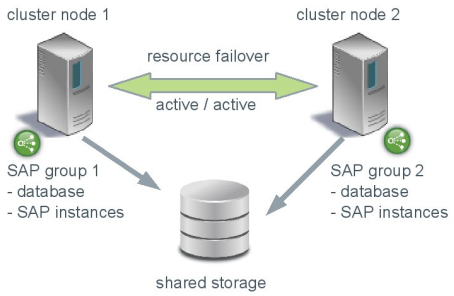
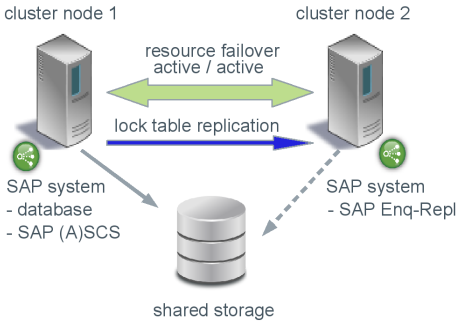
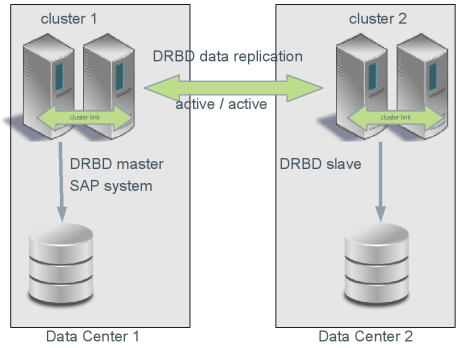
Simple Stack HA



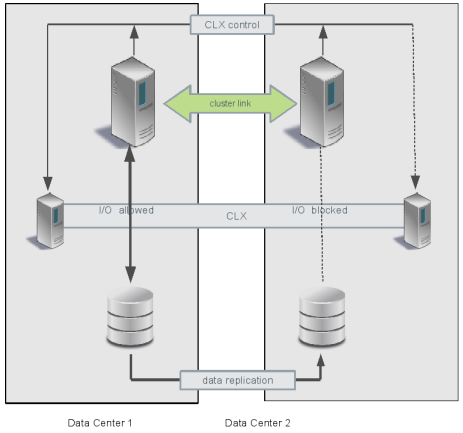
Enqueue Replication



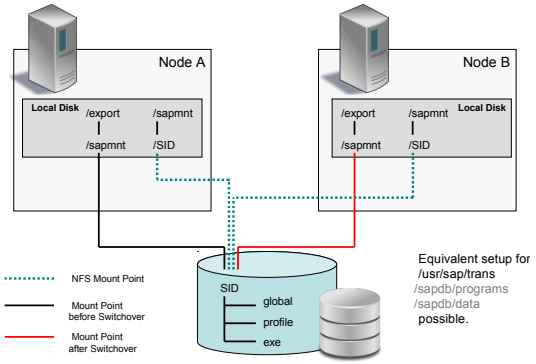
DRBD Data Replication



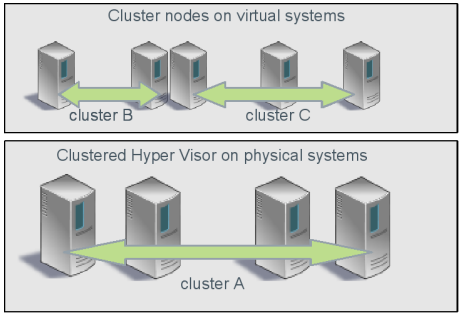
HP CLX SAN Based Mirror



NFS and SAP in one Cluster



HA in Virtualized Environments



Roadmap

Roadmap

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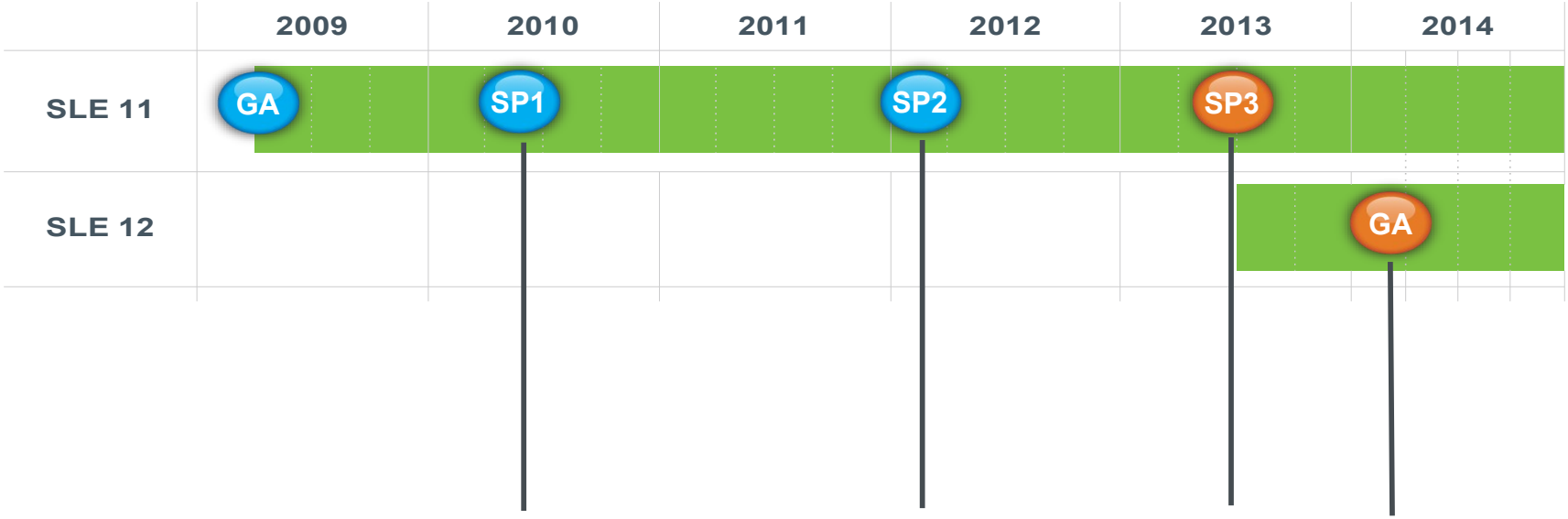

SLE HA 11 SP1

- Metro Area Cluster
- Samba Cluster
- Web GUI
- Cluster Test Drive
- Node Recovery

SLE HA 11 SP2

- Geo Cluster
- History Explorer
- Setup Tools
- Improved Web Frontend

SLE HA 11 SP3

- Remote Monitoring

SLE HA 12

- Web Console
- Cloud integration
- Preloaded Clusters

Comparison

Competition

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Competitive Point	SUSE Linux Enterprise High Availability Extension	Red Hat	Symantec VCS
Requires shared storage	No	Yes	No
Open Source based	Yes	Yes	No
Geo Extension	Yes	No	Yes
Supports virtualization	Hybrid physical, virtual clusters, protects guests and guest apps; supports KVM, Xen, VMware	KVM, apps within guest, clusters physical, virtual servers	VMware ESX server, protects apps in guests
OS integrated tools	Yes	Yes	No
Free tools and resource agents	Yes	No (extra for Load Balancer, Clustered Samba, and SAP Resource Agent)	No (extra charged)
Platform Support	x86, x86_64, Itanium, IBM POWER, IBM System z	Only on x86 and x86_64	x86, x86_64
Major Version Upgrade	Yes	No	No
Rolling Update	Yes	No	No
Node Recovery included	Yes	No	No
Cost	$$	$$$	$$$$

Service Pack 2

Service Pack 2 – New Features

SUSE® Linux Enterprise High Availability

- Easy Installation & Set-Up
  - Templates and Wizards
  - Cluster Bootstrap & Join
- Improved Supportability
  - History Explorer
  - Log File Query Tools
- Efficient Management
  - Access Control Lists
  - Enhanced Web Console
- Additional Capabilities
  - Joining of Clustered SAMBA to Active Directory
  - Load Balancer Connection Tracking and Replication
  - Multiple SBD devices for reliable storage-based fencing
  - ReaR support for SUSE boot media

Service Pack 2 – easy setup

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- Bootstrapping a cluster is really easy:
  - `node1 # sleha-init -i bond0 -t ocfs2 -p /dev/sdb`
  - `nodeN # sleha-join -c 192.168.2.1`
- Configuring a cluster file system or web server
  - Connect to the hawk web console
  - Start the wizard for OCFS2 or web server

Service Pack 2 – Wizards

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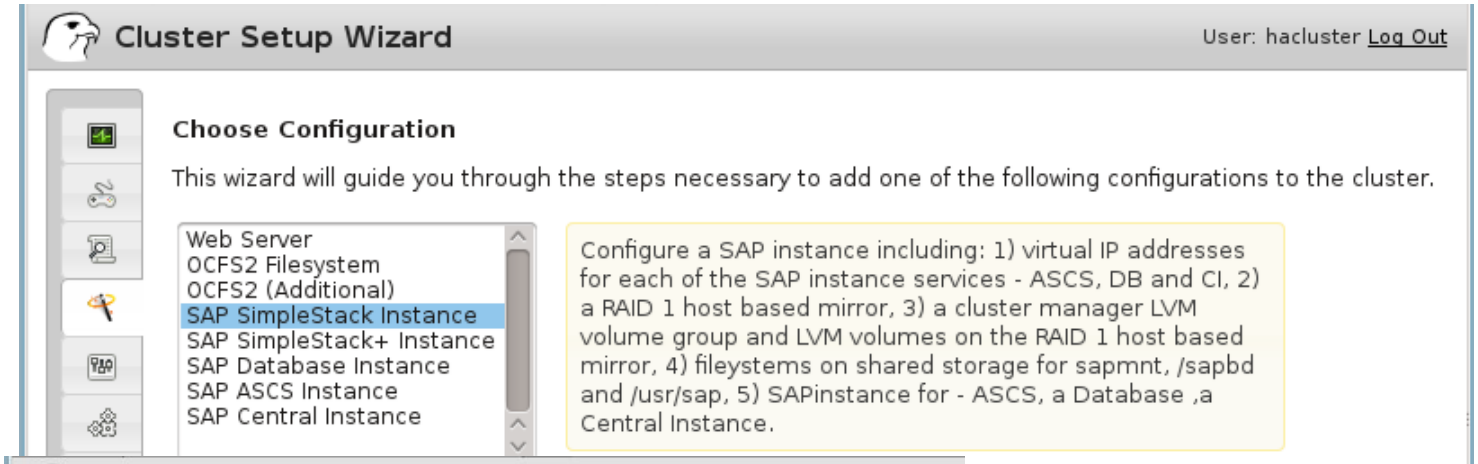

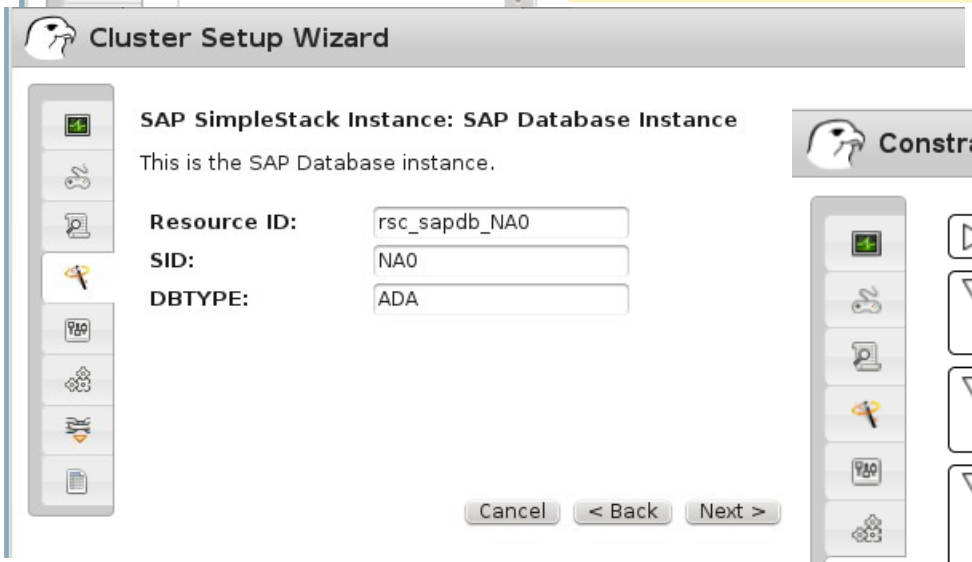

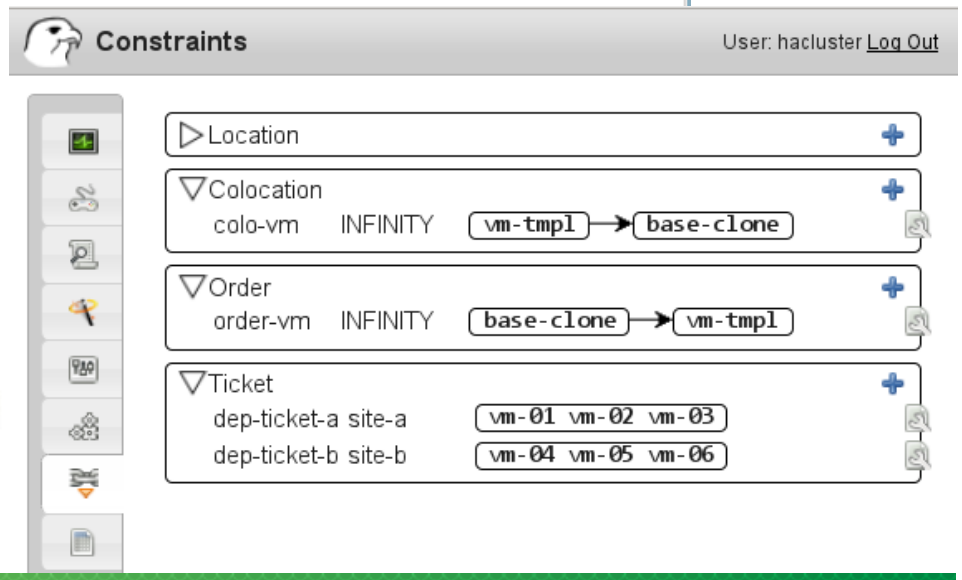

Service Pack 2 – Cluster Simulator

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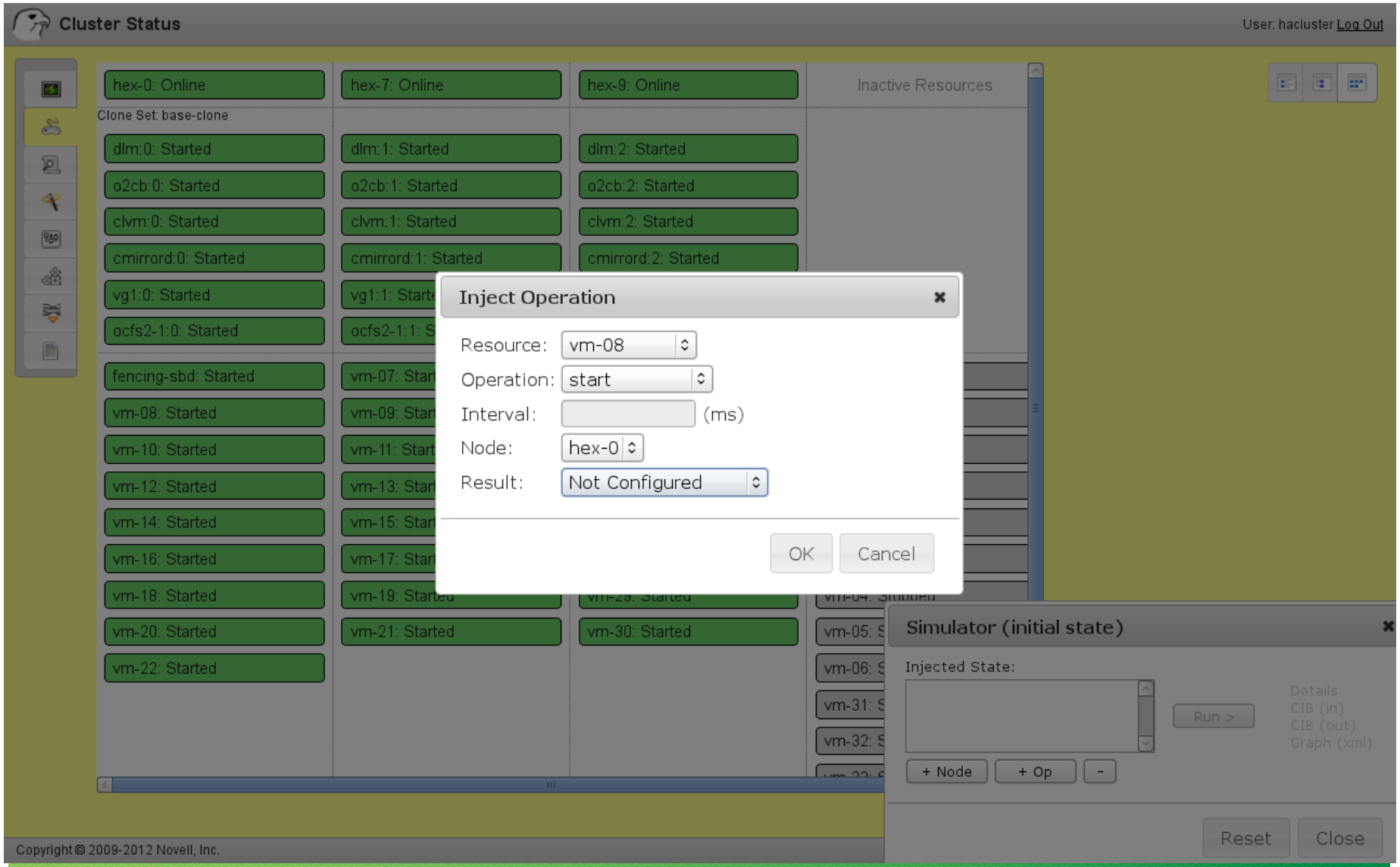

Service Pack 2 – Multiple SBD fencing

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- Shared Block Device (SBD) fencing is recommended by SUSE
  - SBD fencing is highly reliable
  - Independent of management board (firmware, settings, etc.)
  - Equal setup in physical and virtual environments, reducing variance in deployments
- Multiple SBD fencing
  - Supports redundancy in fencing channels
  - Enhanced reliability leveraging independent storage systems
- Integrated with the hardware watchdog devices

Demo

From Local Cluster to Geo Cluster

Local & Stretched Cluster

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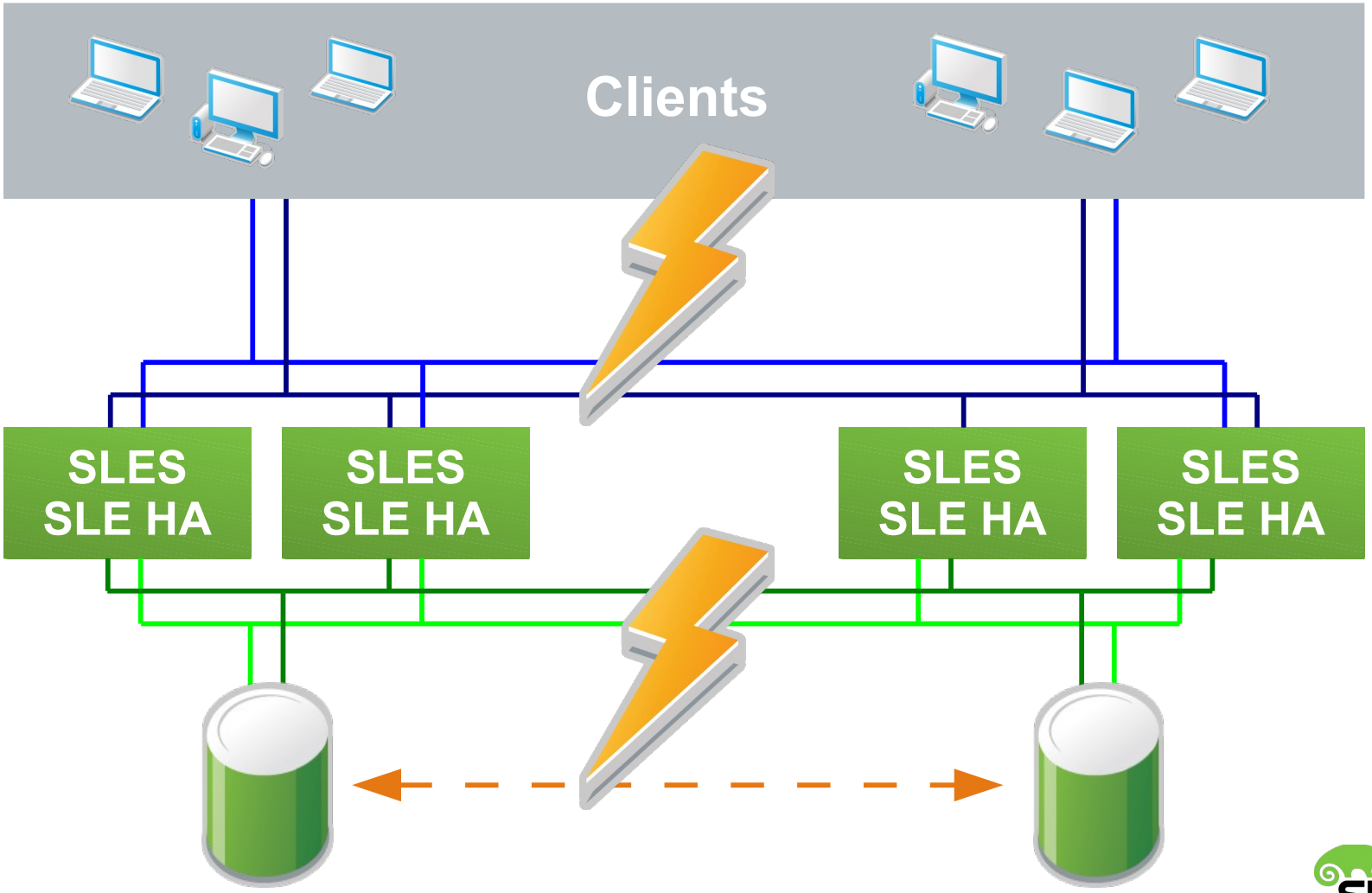

Geo Cluster – From Local to Geo

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- Local cluster
  - Negligible network latency
  - Typically synchronous concurrent storage access
- Metro area (stretched) cluster
  - Network latency <15ms (~20mls)
  - Unified / redundant network between sites
  - Usually some form of replication at the storage level
- Geo clustering
  - High network latency, limited bandwidth
  - Asynchronous storage replication

Geo Cluster – Overview

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- Cluster fail-over between different data center locations
  - Provide disaster resilience in case of site failure
  - Each site is a self-contained, autonomous cluster
  - Support manual and automatic switch-/fail-over
- Extends Metro Cluster capabilities
  - No distance limit between data centers
  - No unified storage / network needed
- Storage replicated as active / passive
  - Leverage Distributed Replicated Block Device (DRBD)
  - Can integrate third-party solutions via scripts

Geo Cluster – Setup

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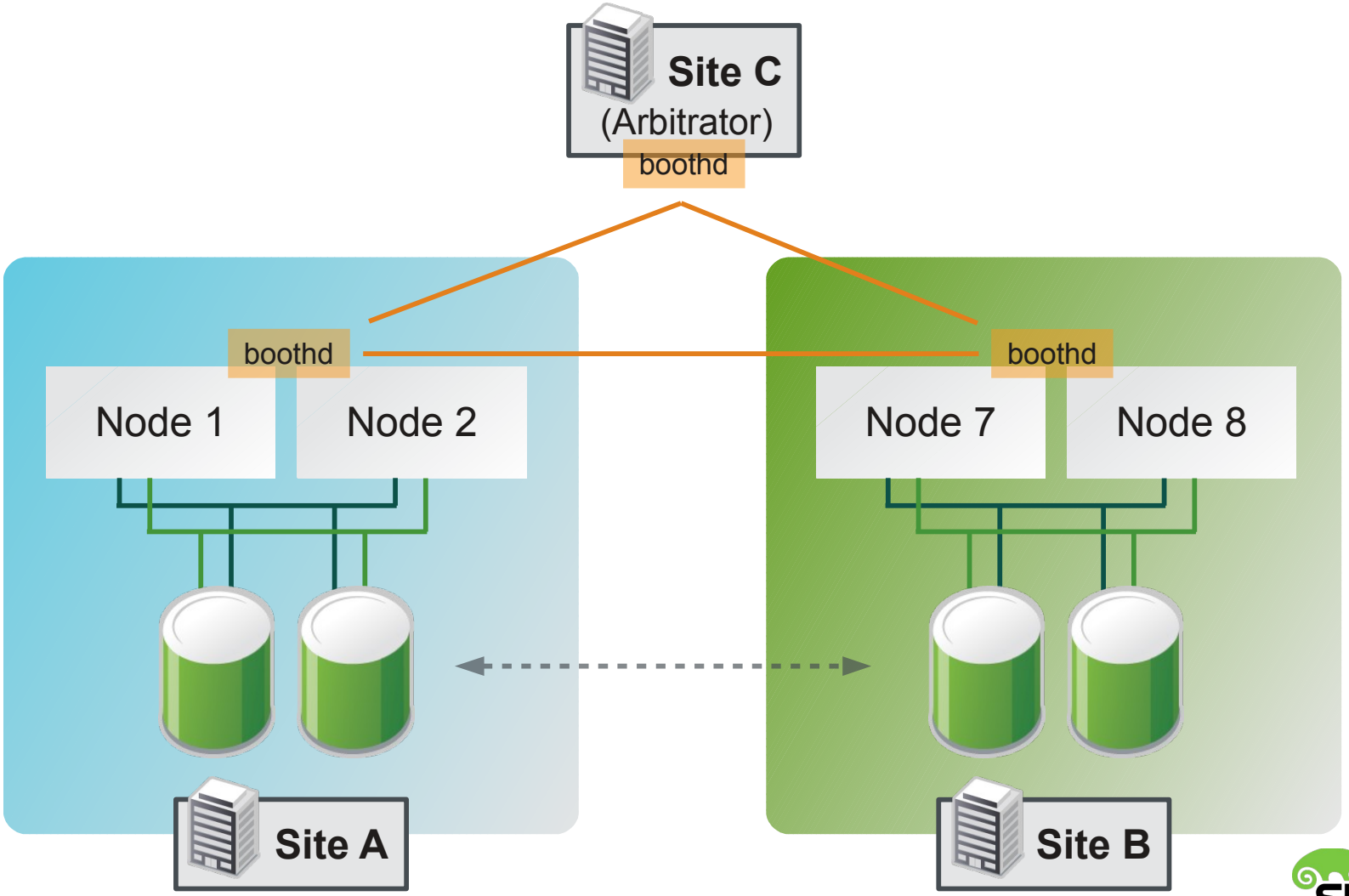

Geo Cluster – Delivery

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- Additional option for the SUSE Linux Enterprise High Availability Extension
  - Each system participating in the Geo Cluster needs a subscription for
    the GEO Clustering,
    the High Availability Extension,
    and the SUSE Linux Enterprise Server
  - The High Availability Extension is part a subscription for IBM System Z
- Support inherited from base server subscription

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Appendix

Architecture

Cluster Example

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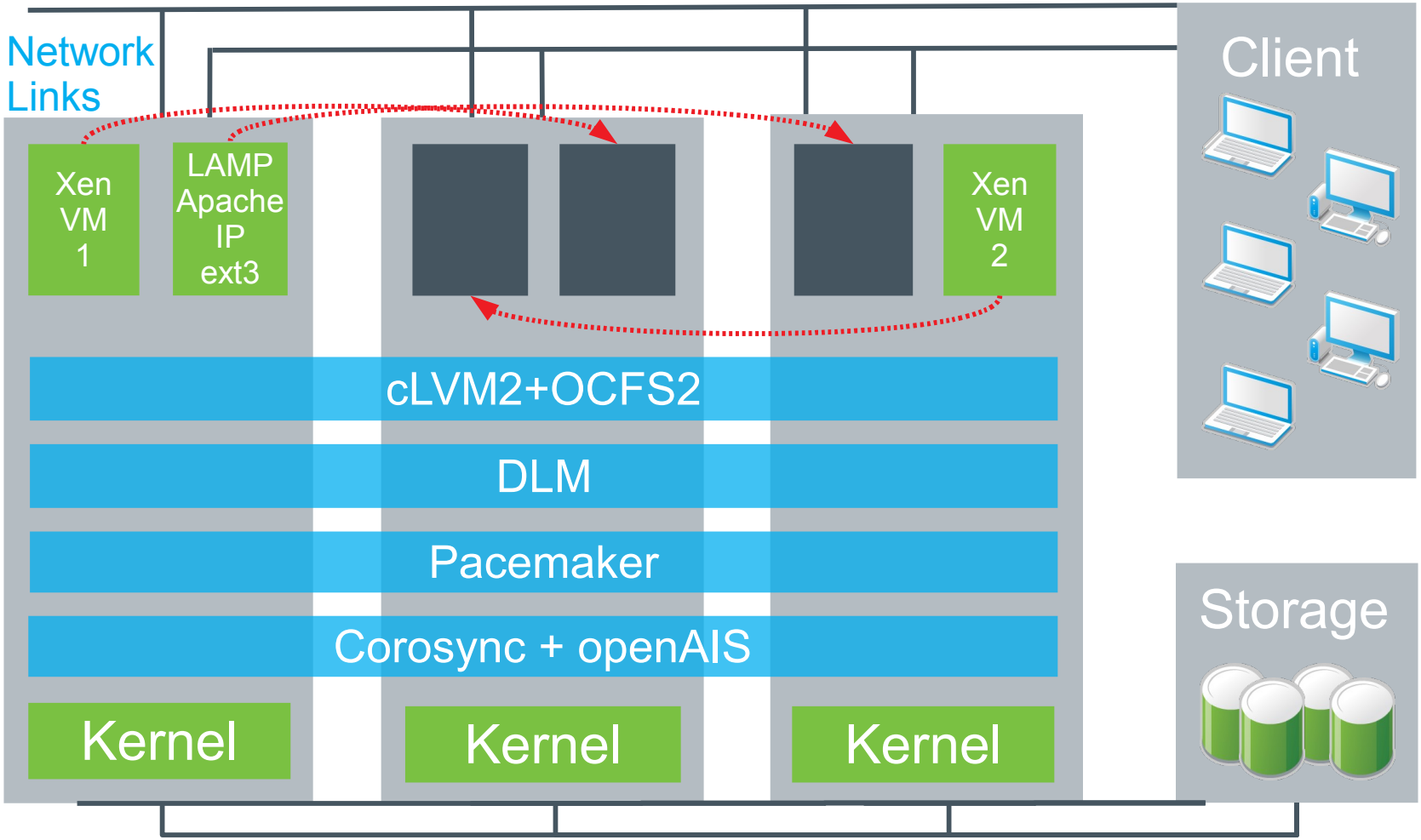

Linux High Availability Stack

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- The stack includes:
  - resource-agents – manage and monitor availability of services
  - stonith – IO fencing support (also Xen and VMware VMs)
  - corosync and OpenAIS – cluster infrastructure
  - Pacemaker – cluster resource manager
  - CRM GUI – graphical interface for cluster resource and dependencies editing
  - hawk – Web console for cluster monitoring and administration
  - CLI – improved command line to interact with the CIB: editing, prepare multiple changes - commit once, syntax validation, etc.

Detailed Architecture

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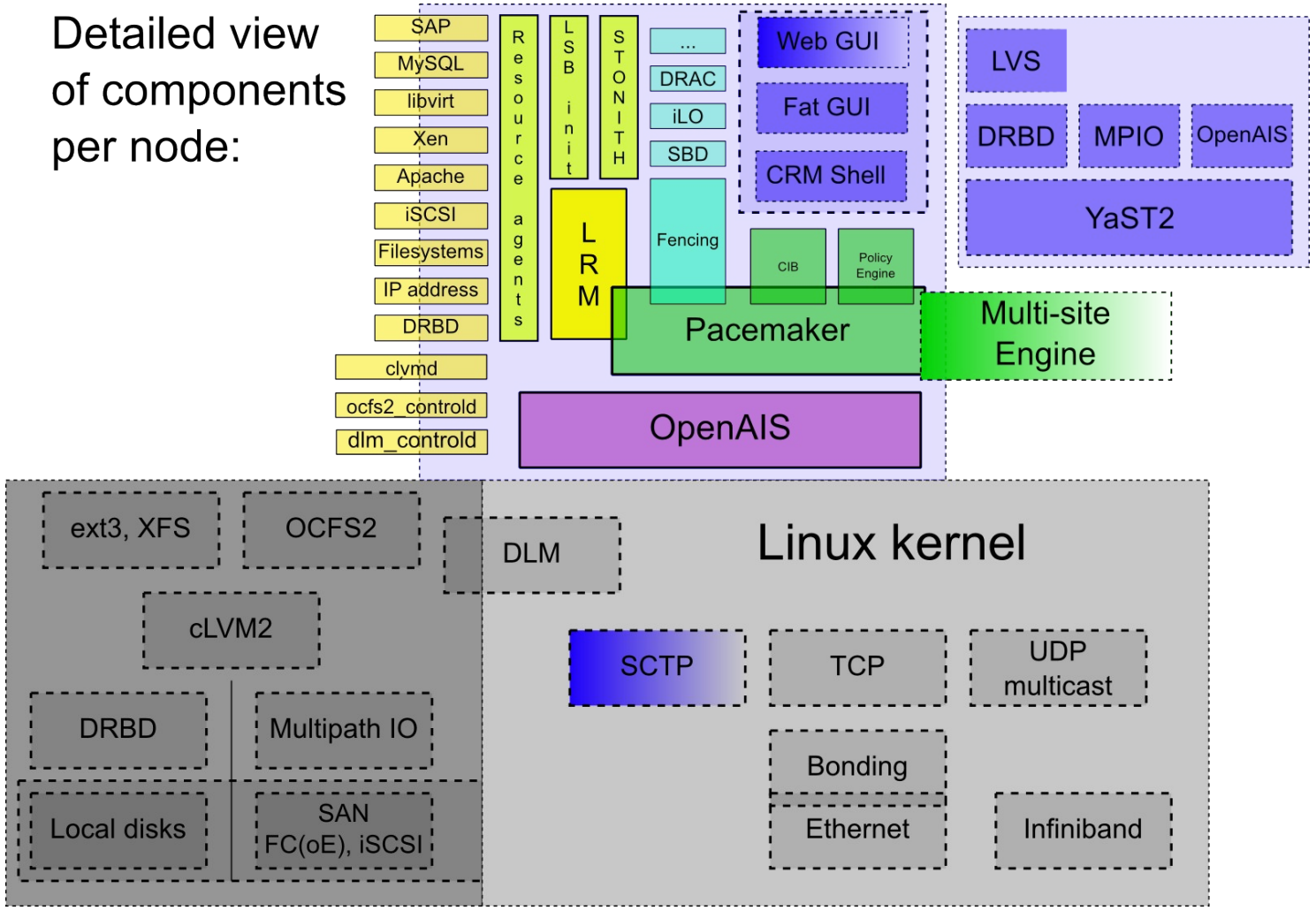
Detailed view of components per node:



Learn more

www.suse.com/products/highavailability

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