



INTRODUCING CHAOS ENGINEERING TO SAP DEVOPS

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What is **Chaos Engineering**



Why don't we do
Chaos Engineering for SAP

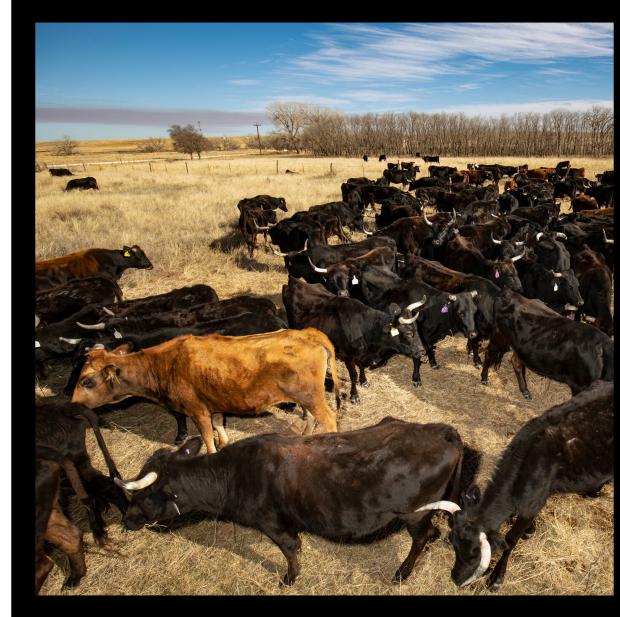






Pet

VS



Cattle

AGENDA

- 1.** What is SAP
- 2.** Chaos engineering
- 3.** Chaos engineering for SAP
- 4.** Challenges and Benefits
- 5.** The help I'm looking for

What is SAP



1 What is SAP

SAP is one of the world's leading producers of software for the management of business processes, developing solutions that facilitate effective data processing and information flow across organizations.



Source: <https://www.sap.com/about/company/what-is-sap.html>

77% of the world's
transaction revenue touches
one SAP system

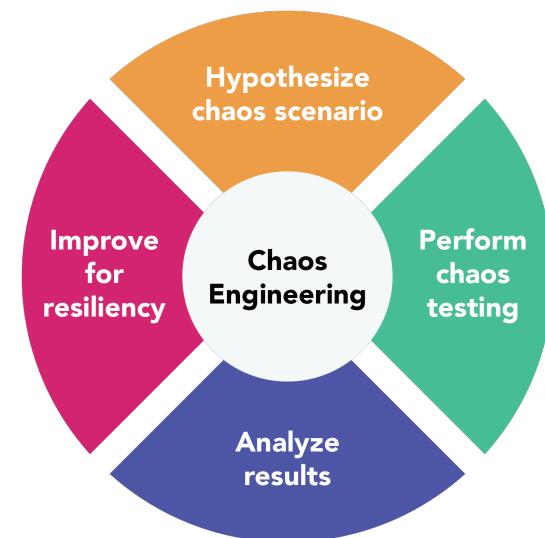
Source: <https://www.sap.com/about/company/what-is-sap.html>

Chaos Engineering

2

Chaos Engineering

Chaos Engineering is the process of testing a distributed computing system to ensure that it can withstand unexpected disruptions.



Source: <https://www.thoughtworks.com/en-in/insights/blog/agile-engineering-practices/building-resiliency-chaos-engineering>

Chaos Engineering

2003 Amazon – GameDay



2006 Google DiRT

2011 Netflix



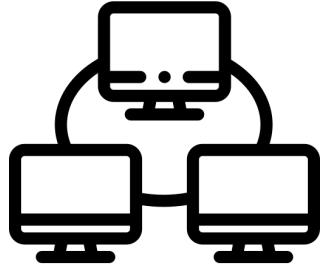
2017 SNCF – Days of Chaos

Facebook Storm

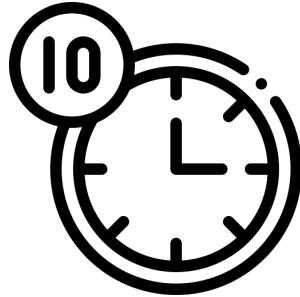
Gremlin



Chaos Engineering



Network reliability
and security

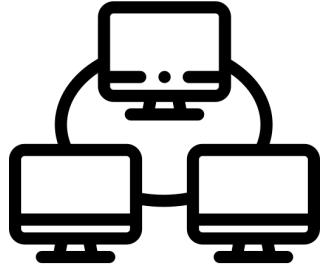


Latency

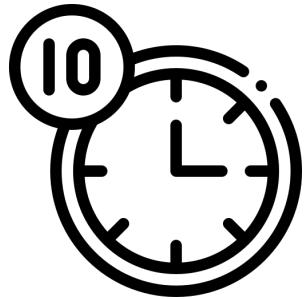


Server resiliency

Chaos Engineering



Network reliability
and security



Latency



Server resiliency



AWS Fault
Injection
Simulator

Chaos Engineering for SAP

3

Chaos Engineering for SAP HANA



Server resiliency



HDB stop

pcs node standby

Kill -9 "hana-indexserver-pid"

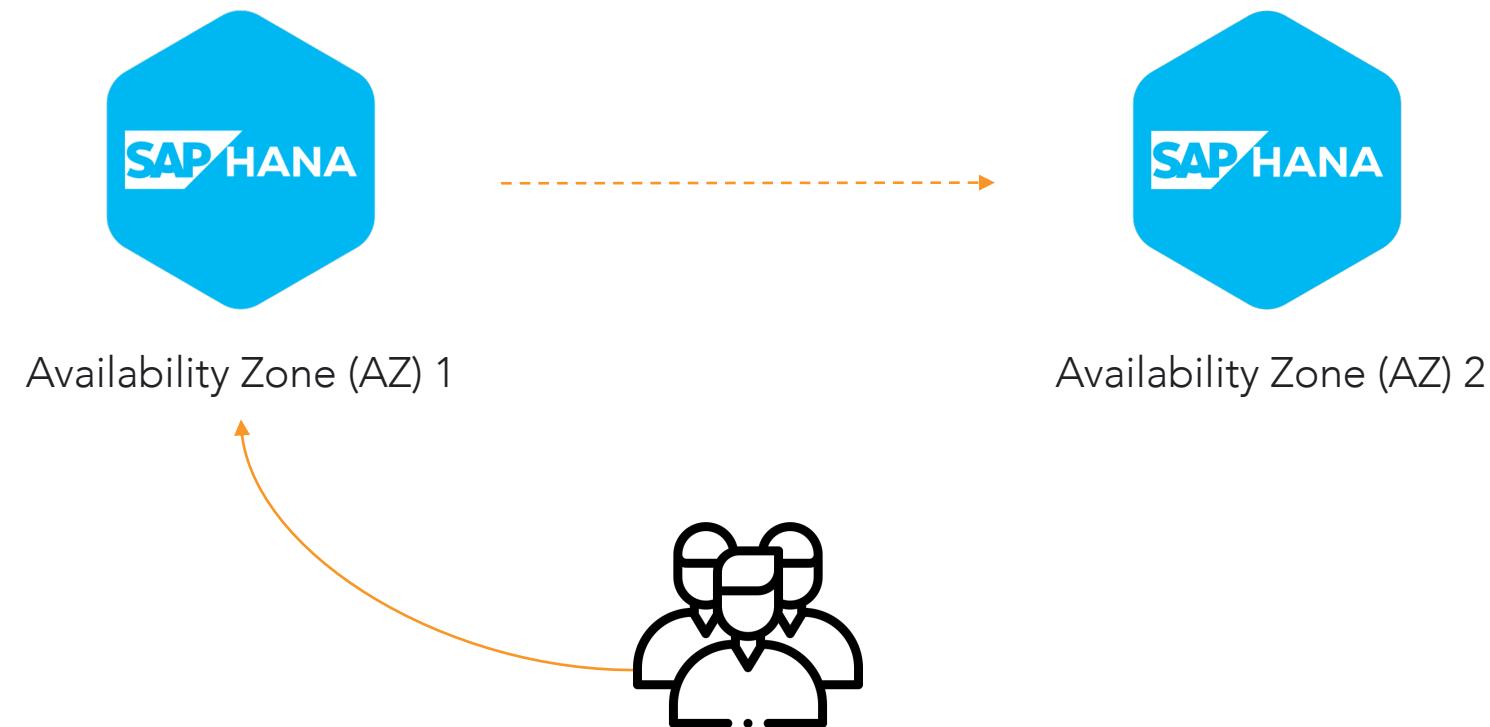
HDB kill -9

Reboot

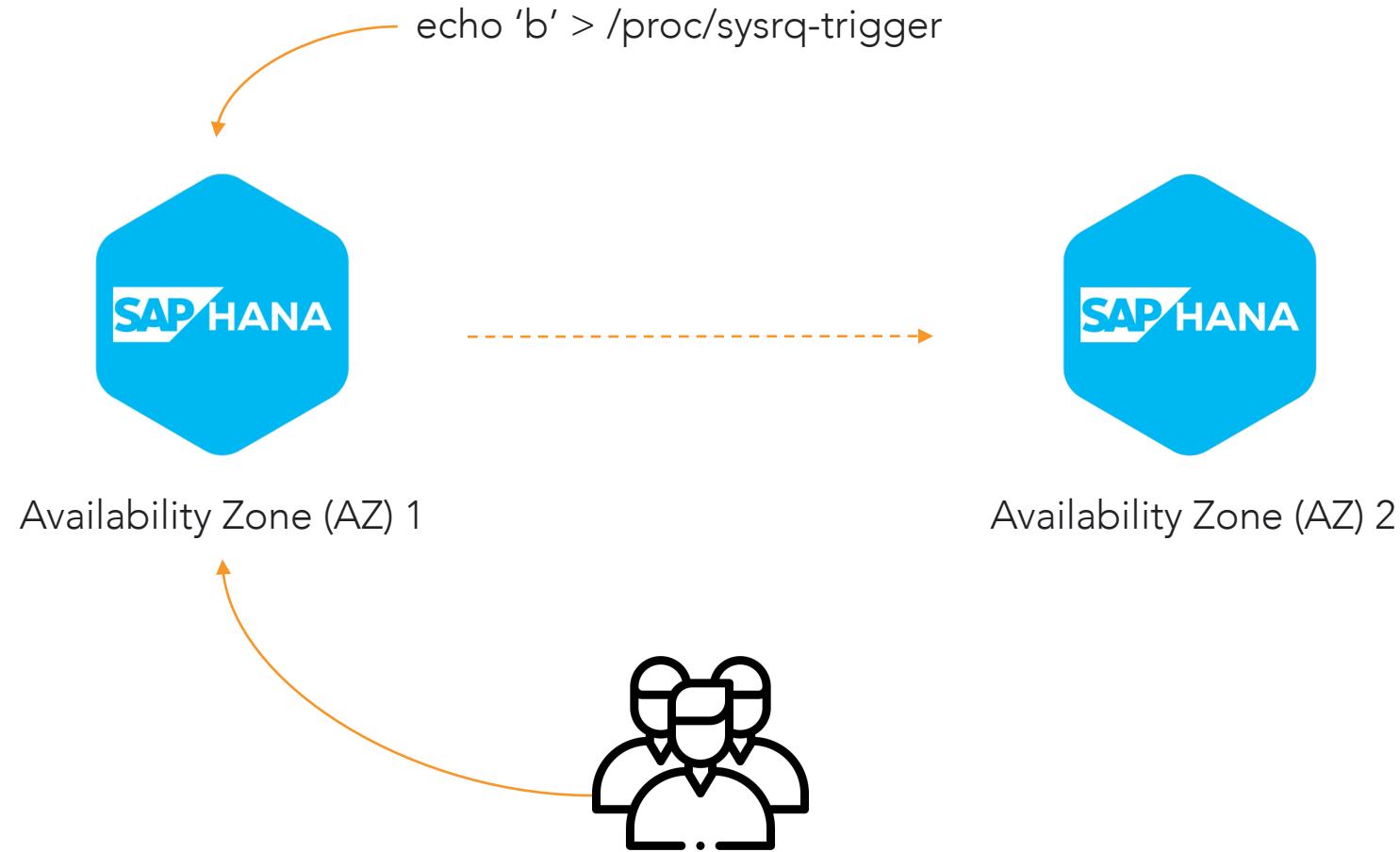
System crash

Takes MONTHS to be completed

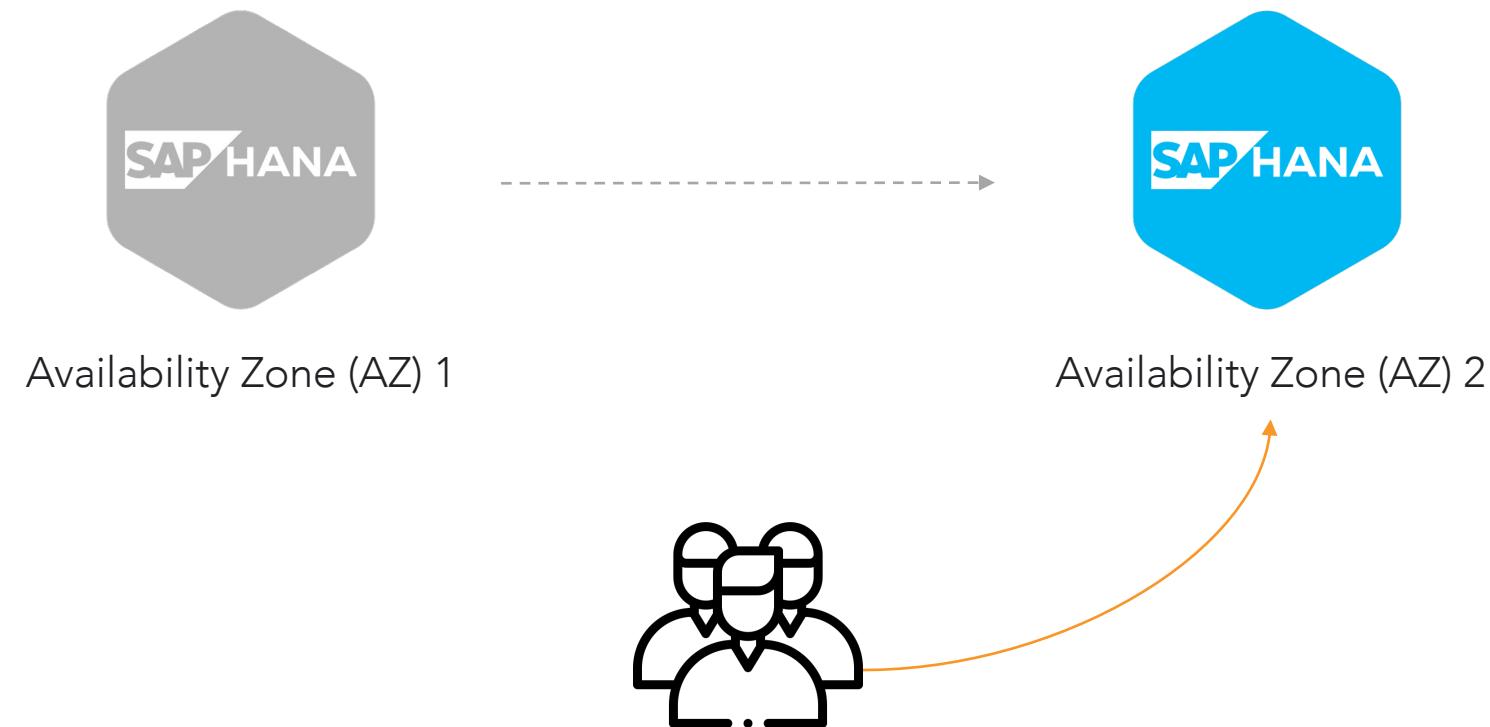
Chaos Engineering for SAP System Crash



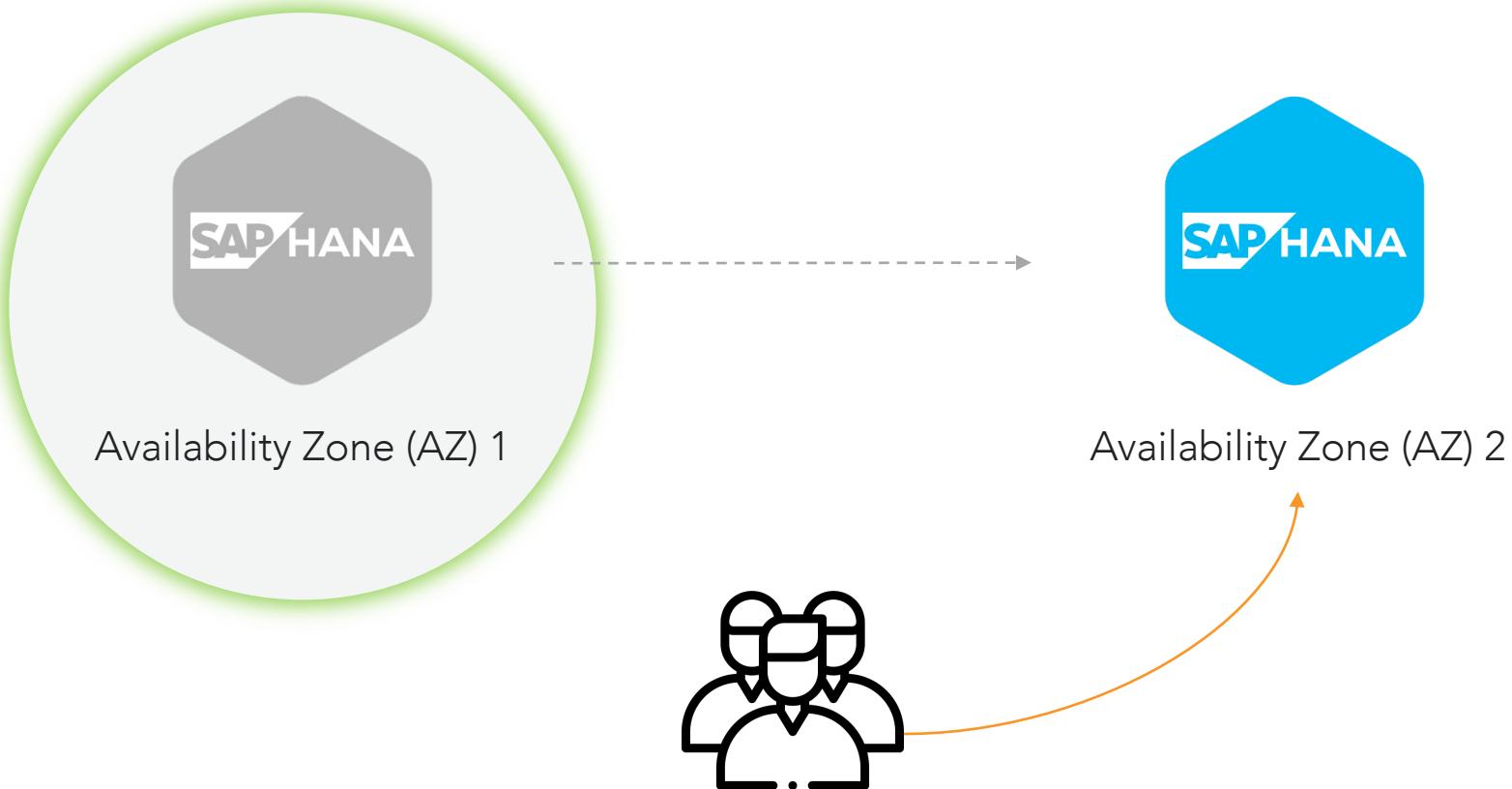
Chaos Engineering for SAP System Crash



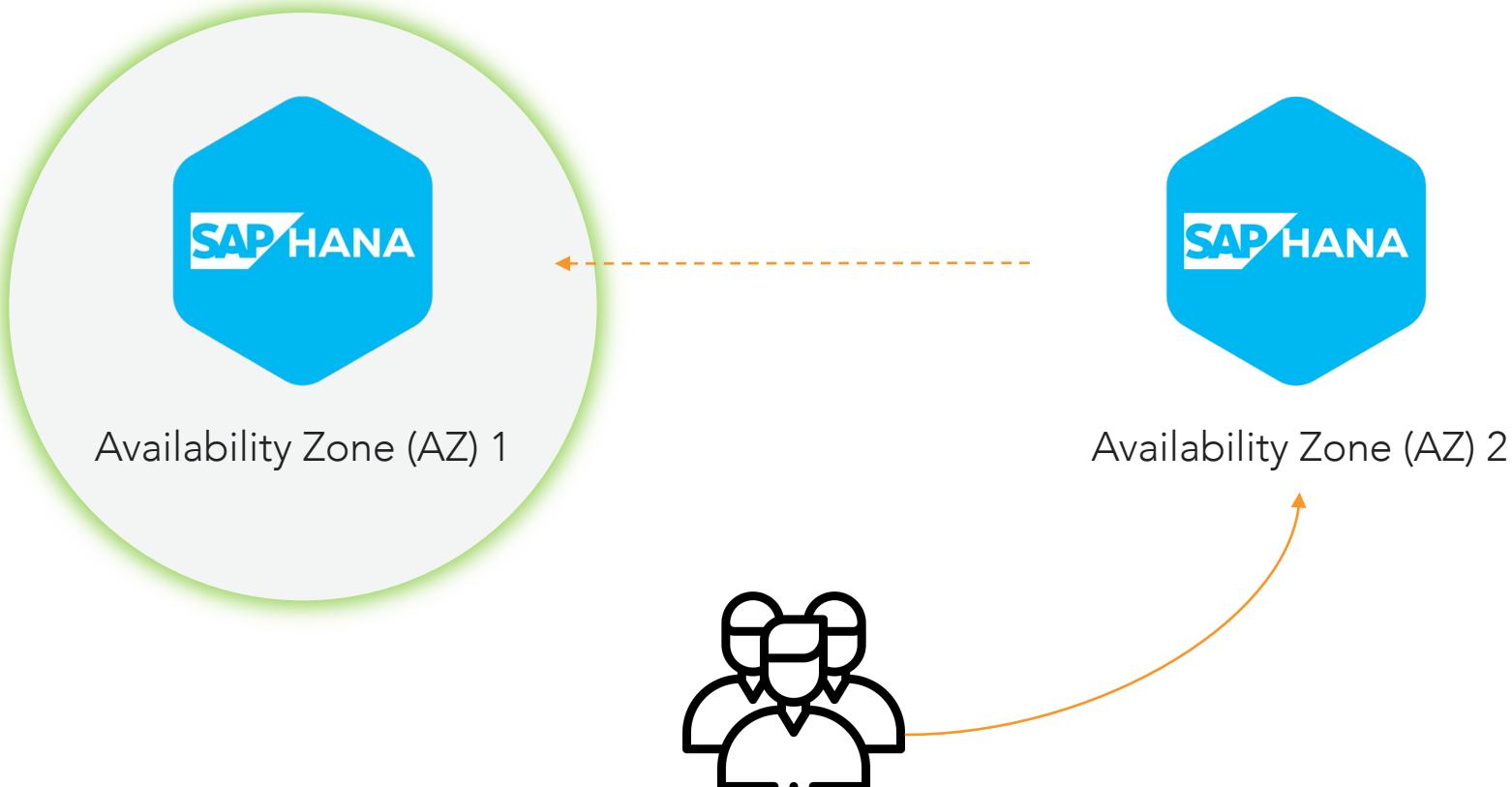
Chaos Engineering for SAP System Crash



Chaos Engineering for SAP System Crash



Chaos Engineering for SAP System Crash



SAP High Availability Automated Testing Results

Successful Executions 6

Failed Executions 1

#	Scenario Description	Result
1	Check inputs	PASS
2	Check current HA installation (prep / bridge tasks)	PASS
3	Stop Primary database with HDB Stop and check failover result	PASS
4	Stop NEW Primary database with HDB Stop and check failover result	PASS
5	Stop Secondary database with HDB Stop and check result	PASS
6	Stop Primary database with "echo 'b' > /proc/sysrq-trigger" and check result	PASS
7	Run POST ACTIONS for scenario CRASH_NODE_PROC_PRE	FAIL

1 - Check inputs



2 - Check current HA installation (prep / bridge tasks)



3 - Stop Primary database with HDB Stop and check failover result

4 - Stop NEW Primary database with HDB Stop and check failover result

5 - Stop Secondary database with HDB Stop and check result

6 - Stop Primary database with "echo 'b' > /proc/sysrq-trigger" and check result

7 - Run POST ACTIONS for scenario CRASH_NODE_PROC_PRE



7 - Run POST ACTIONS for scenario CRASH_NODE_PROC_PRE



▶ Common Steps

▶ ansible-role-bridge-task : Check if HANA is fully up on both nodes with GetProcessList. Waits for it to be up if required by a past failover event

▶ Common Steps

▶ ansible-role-bridge-task : Waits for status message if required by a past failover event

▶ ansible-role-bridge-task : Check if this node is primary

▶ Common Steps

▶ ansible-role-bridge-task : Generate R3trans data

▶ ansible-role-bridge-task : Check if PAS is connected to database "demo-hana2"

▼ ansible-role-bridge-task : Fail if PAS is not connected to database "demo-hana2"

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06T16:48:03.914233Z

Run POST ACTIONS for
scenario
CRASH_NODE_PROC_PRE

ansible-role-bridge-task : Fail if PAS is not connected to database "demo-hana2"

▼ PAS: fail - Changed: false

▼ See full message

PAS is not connected to the database it is supposed to be: demo-hana2. Please check



Challenges and Benefits



Challenges



Time – can take up to a month



Audit processes



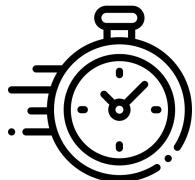
Manual activities are very error prone, and documents hardly cover 100% of the scenarios



Specialized skill set required for extended periods of time



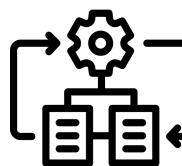
4 Benefits



Time – new HANA database runs in up to 45min



Results automatically documented



Repeatable process that can be automated in a CICD pipeline



The HELP I'm looking for

5

The HELP I'm looking for



Self-resilient actions configuration.

Tested with triggering DB backups



Automate even more the self-resilient actions



Thank YOU!



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<https://go.aws/3qSig4M>

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SCAN ME

