CTDB + Samba: Clustered CIFS Services Growing Up

LinuxCon Europe 2011

Michael Adam

obnox@samba.org

Samba Team / SerNet

2011-10-28

Questions?

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Introduction

about:Samba

Since 1992:

- *The* open source SMB/CIFS/SMB2 file server
- high performance
- production proven and reliable
- used in many products/appliances
- Windows AD domain member
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about:SerNet

- OpenSource/Linux centric company in Germany
- founded 1996
- today: 40-50 employees
- Samba department: 5 Samba core team members including the release manager
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Peace...

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Yin Yang

Peace...

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...but then,

around 2005/2006...


Clusters
ENERGIE
FÜR
DEN TAG

Goal

Create a clustered NAS (CIFS/NFS):

- all-active
- available
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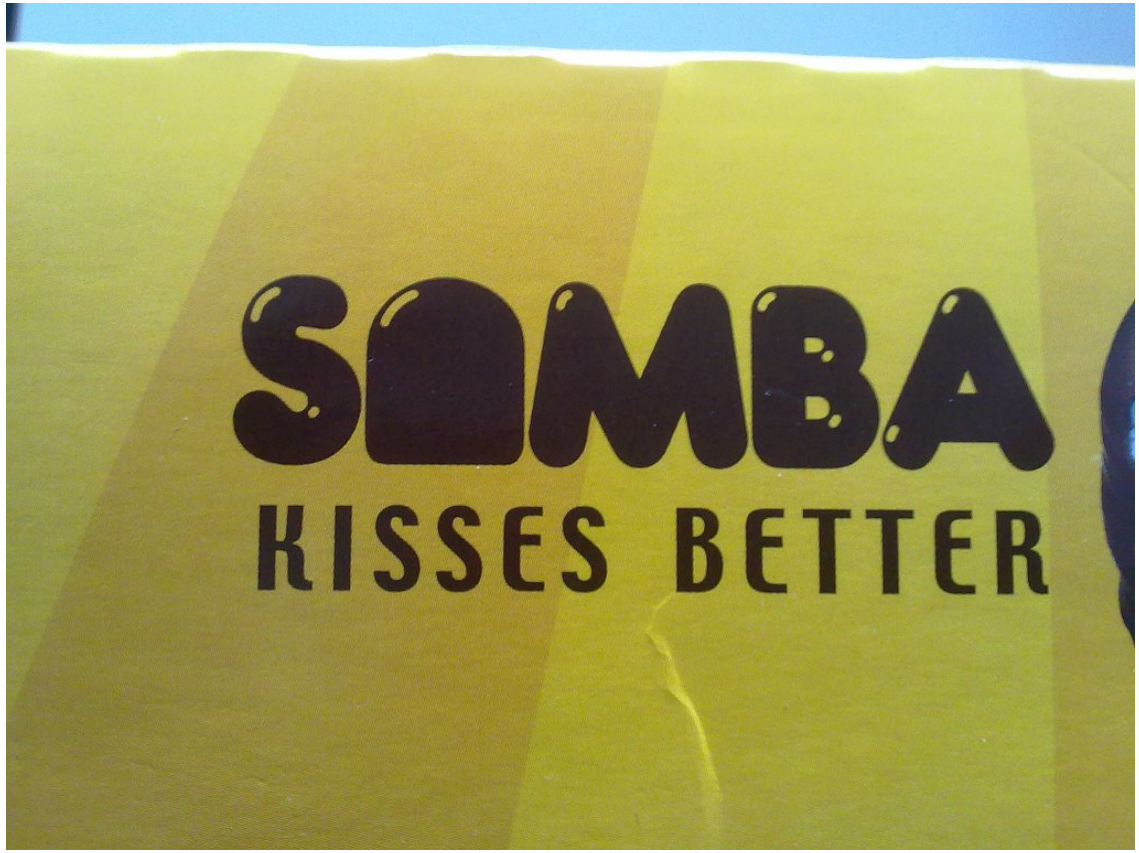

... with **CTDB** ☺

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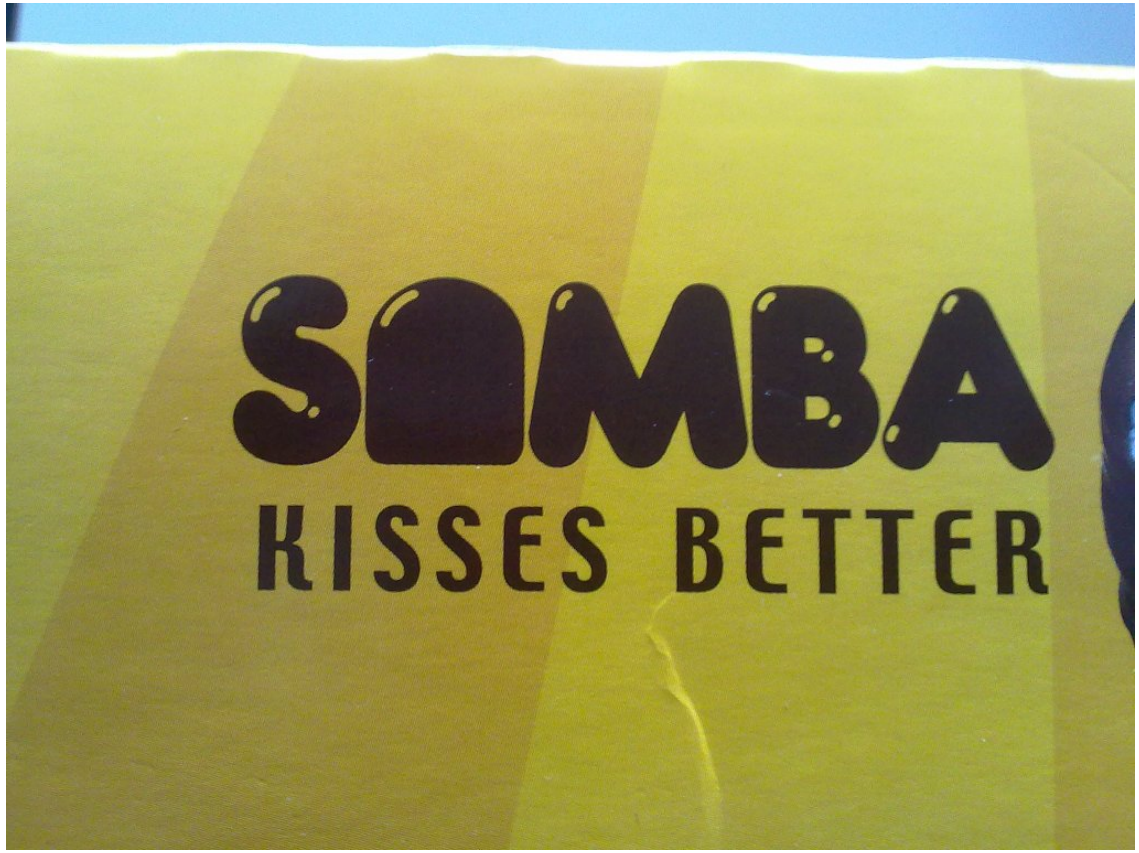

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CTDB

Clustering Samba - Challenges And Chances

- **Prerequisite**: a distributed/clustered file system (POSIX)
- **Requirement:** No client changes! (*Windows*...)

- all-active $\Rightarrow$ all nodes act as *one* CIFS server
- Samba's process model $\Rightarrow$ clustering is imaginable
- IPC: messaging
- IPC: sessions, connections, open files, locks, ...
- Persistent data: secrets, registry, id-map, ...

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- all that stuff is stored in *TDB* databases
- TDB (trivial database):
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- is a very special clustered database implementation (may lose data...)
- is an inter-node-IPC implementation for Samba (messaging)
- is also a simple cluster service management software
- makes Samba on a file system cluster appear as a single CIFS/SMB/SMB2 server
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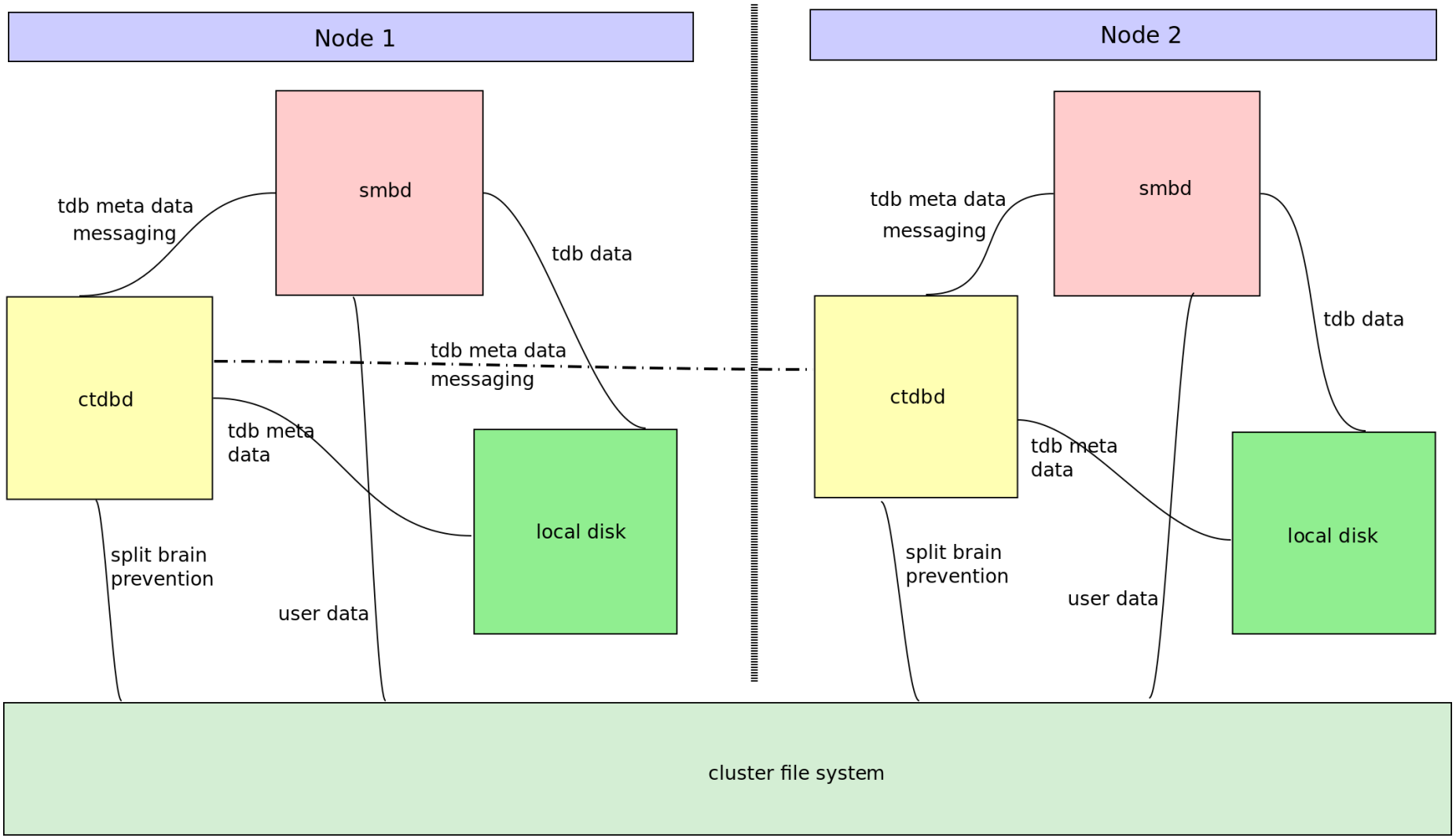

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- CTDB client library (`libctdb`)
- read-only record copies (ongoing)
- smb 2.0: durable handles
- smb 2.1: multi-credit, resilient handles, leasing, ...
- smb 2.2: multi-channel, persistent handles, RDMA, cluster features

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- Microsoft embraces CIFS clustering
- client changes: much of the failover logic in the client
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- intended to replace NFS and SAN use cases
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Management and Integration

CTDB as cluster manager

- manages services (samba/winbind/nfs/apache/...): start/stop/monitor
- pluggable extensible event script architecture (`/etc/ctdb/events.d/`)
- handles IP (re)allocation on public network: fail-over/fail-back
- tickles clients to reconnect in case of fail-over

- When this was created, Linux cluster stack did not have all-active.
- But nowadays, pacemaker is getting more popular in distributions.
- All of the above CTDB features are optional.

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Integrating CTDB and Samba

Two choices:

Independently of Linux cluster stack

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- CTDB manages winbindd
- CTDB manges public IP addresses

As managed resources

- CTDB does not manage samba, winbind nor public IPs
- CTDB only provides clustered TDB services
- Linux cluster suite (pacemaker) manages CTDB and Samba and Winbind
- Resource dependency: Cluster FS ⇒ CTDB ⇒ winbindd ⇒ samba

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  - currently (RHEL 6) CTDB is run as system service managing Samba, not as a cluster resource
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- SuSE
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Thank you very much!