

Novell® Open Enterprise Server 2015

Deep-Dive

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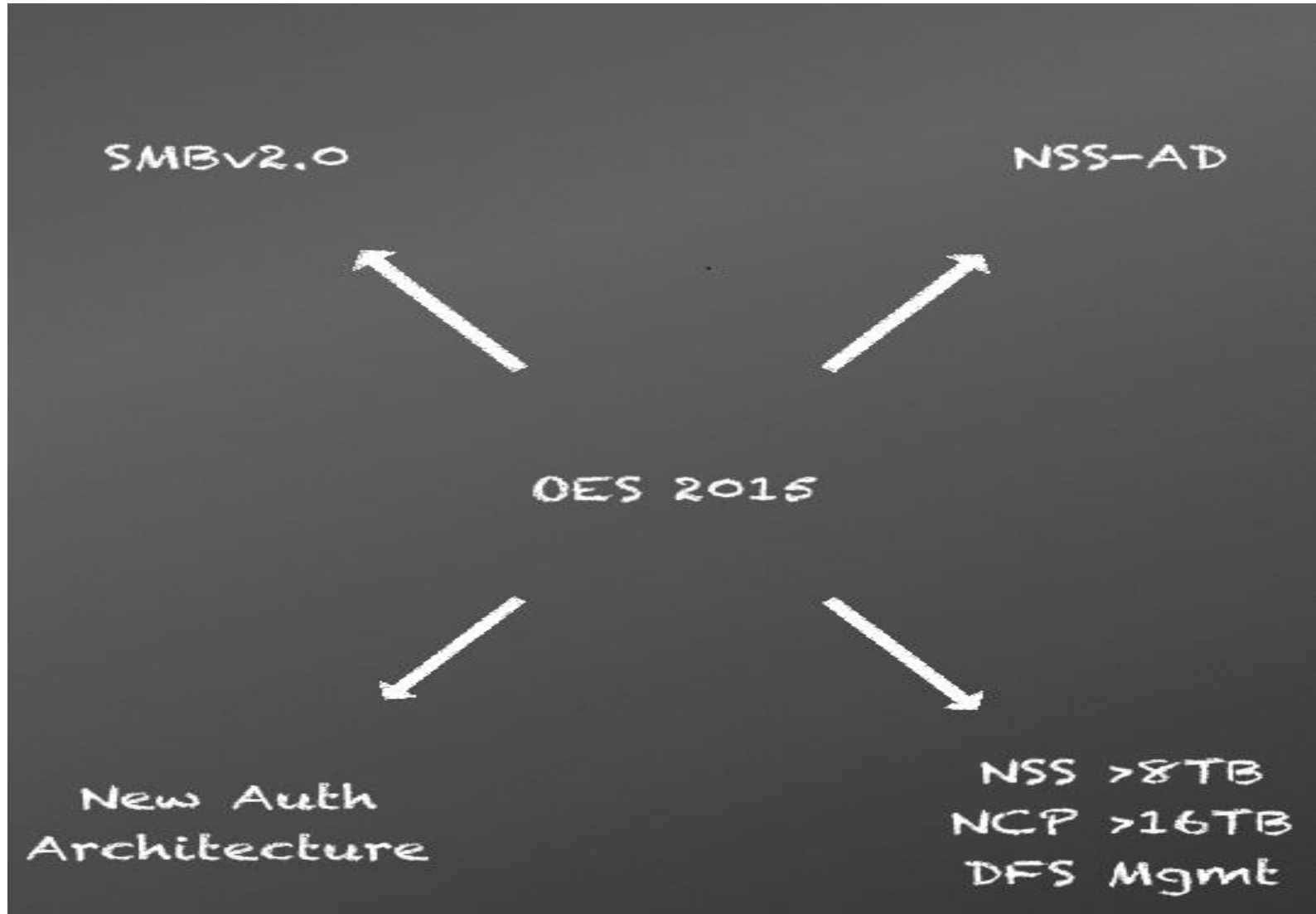
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Agenda

- Overview
- Active Directory (AD) Support
 - Overview
 - Architecture
- SMB 2.0 Support
- Large Pool/Volume Support
 - 8TB+ Support (NSS)
 - 16TB+ Support (NCP)
- Enhanced DFS Junction Management

OES 2015

Highlights



NSS-AD - Overview

OES 11

Identity



- eDirectory
- LUM



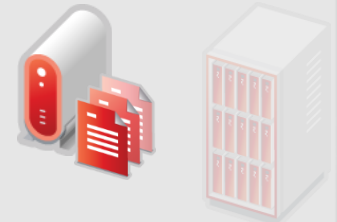
Access Protocols

- NCP
- AFP
- FTP
- SMB v1



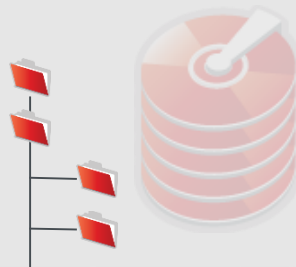
Data Management Services

- DFS
- DST
- SMS
- Migration



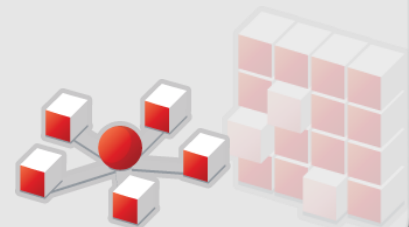
File System

- NSS
- NLVM
- RAID



Clustering

- NCS



OES 2015 – ‘Altair’

Identity



- eDirectory
- LUM



- **Active Directory**



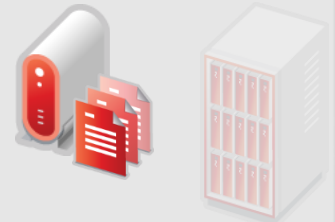
Access Protocols

- NCP
- AFP
- FTP
- **SMB v1 & v2**



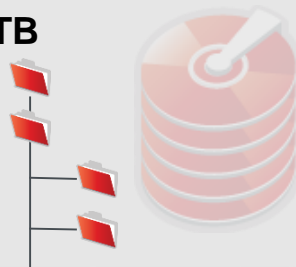
Data Management Services

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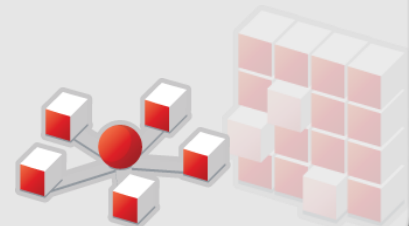
File System

- **NSS > 8 TB**
- NLVM
- RAID



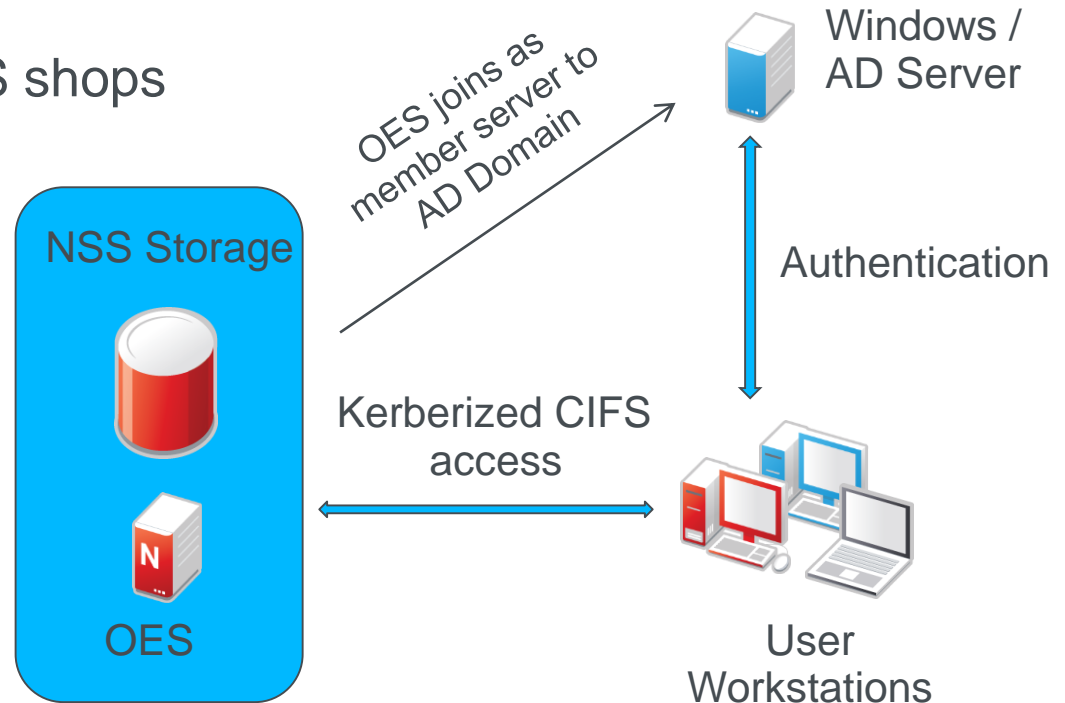
Clustering

- NCS



NSS Access for AD Users

- Continue to leverage NSS file system investment and keep NSS features / benefits
 - Allows corporations with mandate to consolidate to one directory (AD)
 - Integrate acquired MS shops



Approach Highlights

- Native Integration with AD
- Enable AD users along with eDirectory users for file access – allows concurrent access
- AD Support is an Optional Capability
- Authorization – NetWare® / OES style Trustee Model
- Authentication – Kerberos
- Management
 - User Management using MS Tools for AD world
 - Novell® Rights Management using explorer shell extension
 - NSS Administration using Novell Tools
- Runs on OES Linux (Not Windows)

Native Integration with AD

- Member Server
 - OES would join AD domain as member server
- No Copies / Clones of AD users
 - Users exist in one place only - AD
 - No emulation / No virtualization
- No additional software needed
 - No NetIQ Identity Manager (IDM)
- Data (and meta-data) is not tied to individual servers
 - File meta-data regarding identities are NOT stored server centric, but network wide valid information is stored.

Mixed eDirectory + AD Use-Case

- Both eDirectory and AD users can access the same files
 - Yes, concurrently!!
 - Transition time for user or Department moving to AD
 - Acquisitions & Integration
- No attempt to map identities
 - Will NOT do run-time mapping of same identities/ACL from both AD/eDir directories
 - Identities/ACL from different directories will be treated differently
 - Changing ACL in eDirectory will not automatically flow to AD

Is eDirectory Going Away?

- eDirectory is NOT going away
- eDirectory will continue to be developed and enhanced
- AD Support - Optional added capability
- eDirectory foot-print to continue
 - OES file services still need eDirectory
 - Additionally enables users from AD to access files

Authorization

- NetWare® / OES style trustee model
- Novell® style Visibility and Inheritance
- Does NOT stamp each object with ACLs
 - Scales well in large environments
- Plugin to Explorer for Rights Management
- Background SEV Refresh
 - User logout is not necessary for changed rights to come in to effect

Authentication

- Kerberos
- Enables Single sign-on capability
- Enhanced Security
 - OES CIFS server enabled to work with Kerberos for AD users
 - NTLMSSP in place of NTLM for eDir users
- Dynamic detection of eDir and AD users

AD Group/Domain Support

- Groups
 - Universal
 - Global
 - Domain Local
 - Nested Groups
- Domain
 - Multi domain
 - Single forest

Management / Administration

- Rights Management using MS Environment Integrated Novell® Tools
 - Shell Extn, Novell File Access Rights Management (NFARM)
- Server / Storage Management continues with Novell Tools
 - Share Mgmt continues with Novell Tools in OES 2015
- New Tools to provide a combined view of ACLs
- Migration
 - Novell User Rights Map (NURM) to migrate ACLs from eDirectory users to AD
 - User migration – Use existing methods

Ecosystem

Minimal Impact

- Partner Products

- Anti-Virus
- Backup
- HSM
- Auditing

- Novell® Products

- DSfW, Filr, iPrint
- ZENWorks®

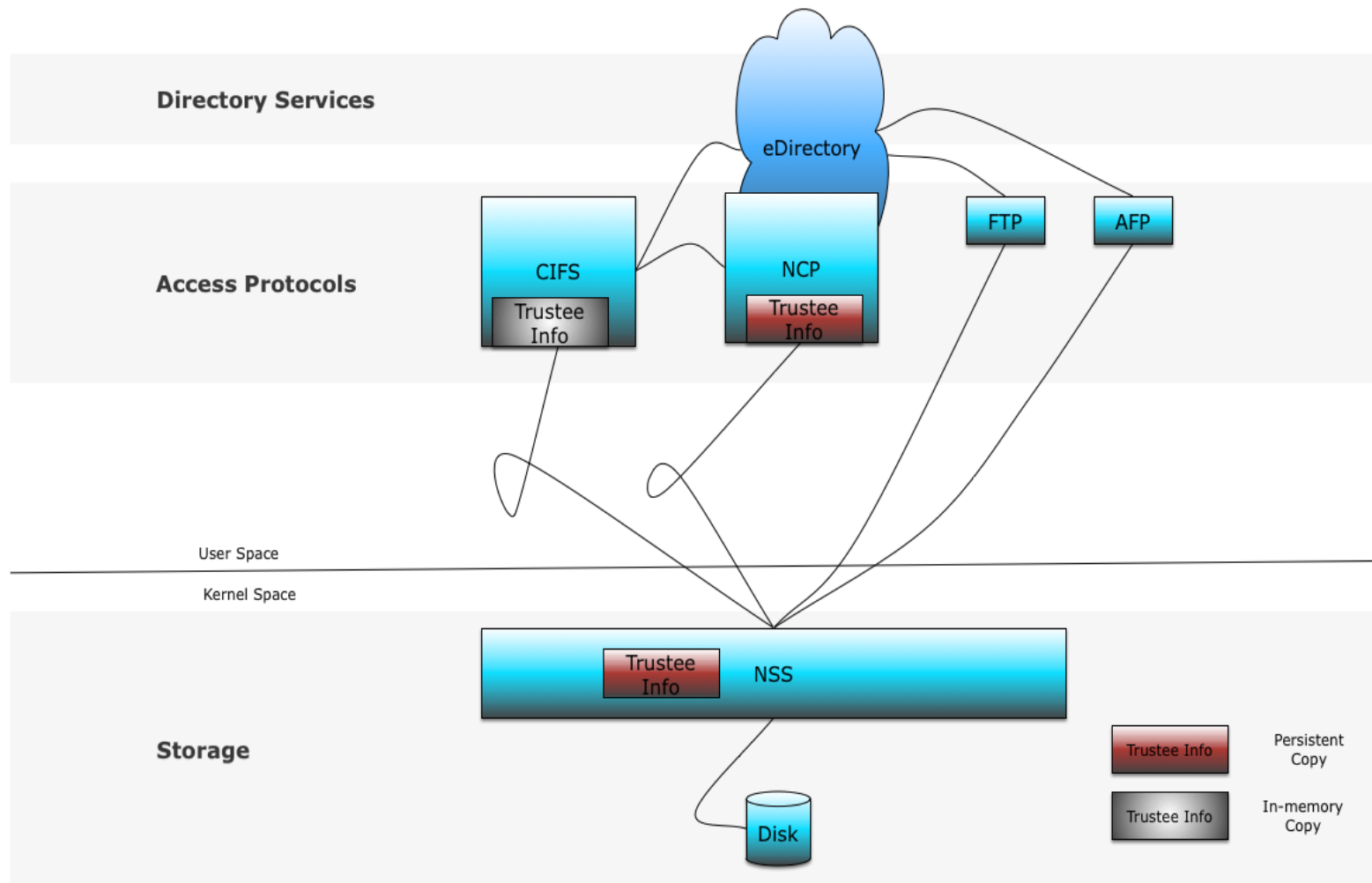
OES Features

Support for AD

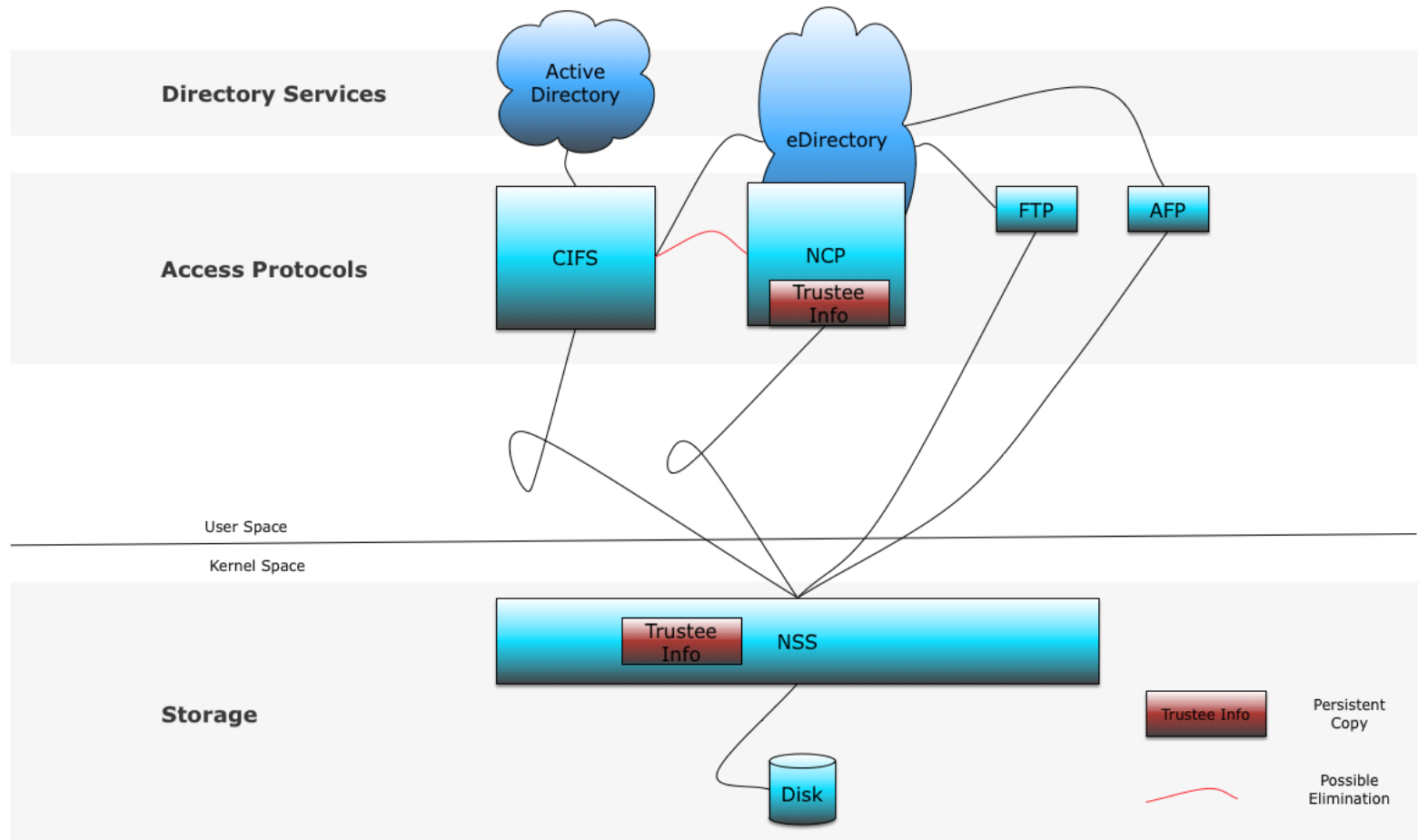
- CIFS
- Novell® DFS, Novell® DST
- Auditing
- NCS
- NetStorage – Post Altair
- FTP – Post Altair
- Salvage Support – Post Altair
- *NCP* (no AD support, eDir support continues)
- *AFP* (no AD support, eDir support continues)

NSS-AD - Architecture

OES11SP2 Authorization Architecture



OES 2015 Authorization Architecture



CIFS-NSS Unified Authorization

- New Architecture – CIFS in OES 2015.
 - Trustee information is maintained in one place – NSS
 - Authorization enforcement is done by CIFS and NSS
 - UID fetched from NIT (Novell® Identity Translator)
 - Stateful - FID Creation (CIFS), Other Operations (NSS)
 - Stateless – NSS
 - Retains the single file handle optimization
 - CIFS uses the new architecture for both AD and eDir users
 - NCP may adopt in the future

Novell® Identity Translator (NIT)

- Single Point of Contact for eDir and AD identities
- eDir only / eDir and AD mode
- Generates UID
 - eDir users doesn't require LUM enablement
 - AD users need not necessarily have uidNumber attribute populated
 - Configure UID range appropriately
- Converts Identity attributes
 - GUID, UID, Name and SID(for AD alone)
 - Cache
- Fetches / calculates SEV

Architecture

Highlights & Benefits

- Highlights

- Unified Authorization
- Foundation for Unified File Access Experience

- Benefits

- Reduction in Administrative Complexity
- OES Platform being made even more secure
- Consistent User Experience
- Extensibility
 - New Protocols can simply plug-n-play. e.g., FTP
- Improved Maintainability
 - Simplified Architecture; Increased Reliability

SMB 2.0

SMB2.0 Benefits

- Reduced Network Traffic
 - Through usage of less number of verbs (19 verbs Vs 100+ in SMBv1)
 - Compounding
- Increased Security
 - HMAC-SHA256 for signing
- Increased Scalability
 - Higher limits in terms of number of users, open files, number of shares, and also number of TCP connections per client
- Performance Improvements
 - SMB2 is more robust and is designed to perform better in high speed network environments

OES 2015 SMB 2.0

Feature Overview

- Co-Exists with SMBv1
 - Protocol selection through handshake
 - Config option to control selection process
- Single Stack Implementation for both SMB v1 & v2
 - All existing capabilities will be supported.
- DST & DFS Support
- Compounding – supported
- Achieves SMB 2.0 verb compliance.
 - Enables client to communicate with OES using SMB 2.0 protocol.
 - Implements all verbs needed for compliance.

>8TB NSS

>8TB NSS Support - Overview

- Support for > 8 TB NSS Pools
 - Supports data center growing storage needs > 8TB volumes and file sizes
 - Uses a new Media Format
 - Old and New pools can co-exist on the same server
- Why?
 - NSS on-disk data structures contain 32-bit block numbers.
 - Hence, pool size is restricted to 8 TB [^{**} At all places here, TB = TiB = $(1024)^4$]
 - Pools/Volumes are media compatible from NW to OES11

Scope

- Allow creation of pools >8TB
- Allow co-existence of <8TB (old) and new pools
 - Support data from existing OES servers
- In place upgrade for NSS32 pools (to new pool type) not supported

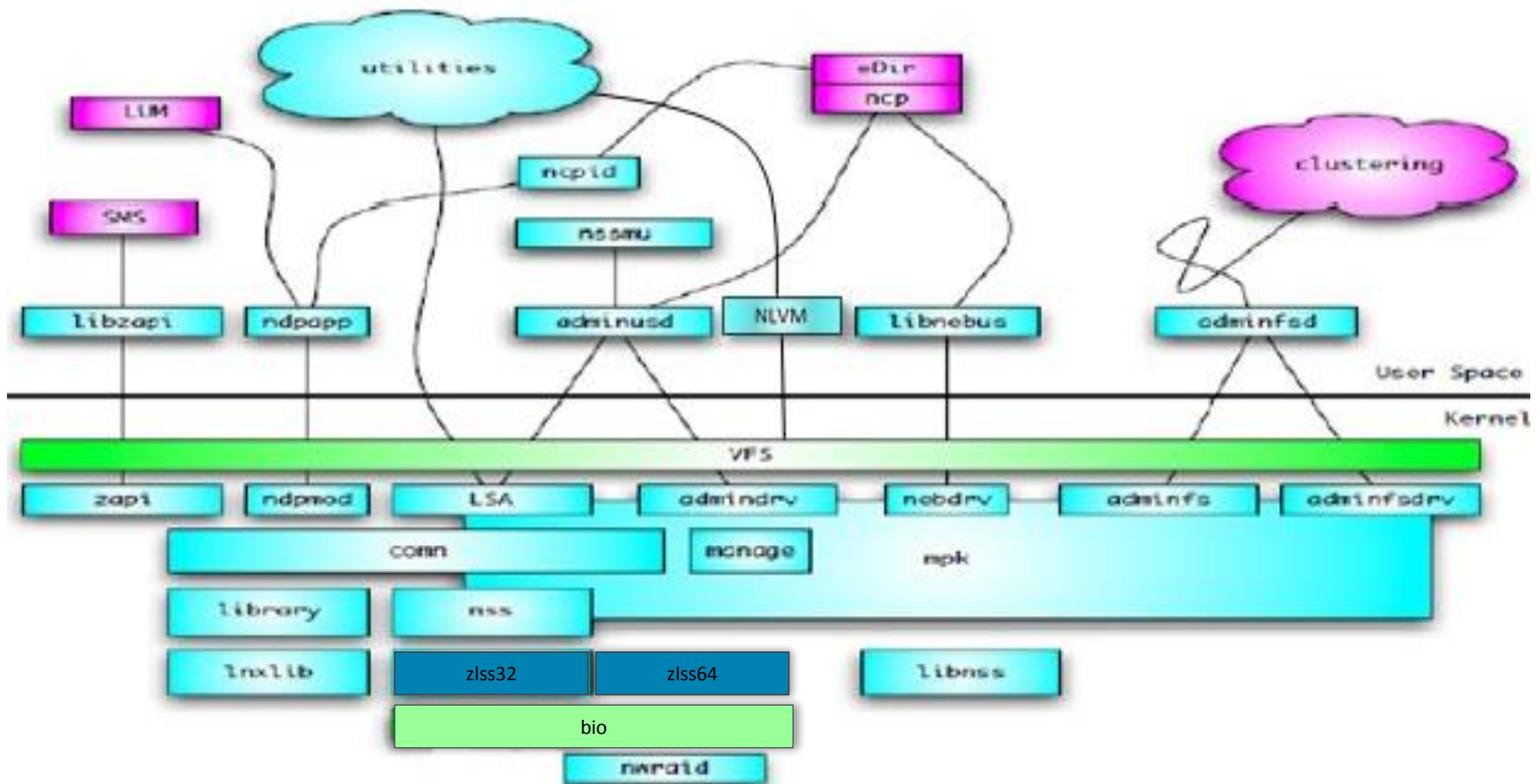
Note: New pools created with NSS64 can't be migrated to OES11/OES2

>8TB NSS - Approach/Design

- NSS on-disk data structures to contain 64-bit block numbers
- 2 ZLSS modules for 32-bit and new 64-bit block pools
- NSS identifies FS type and contacts the right ZLSS
- NSS management tools provide options to select the pool type

Note: NSS64 Pool – 8EiB (2^{63} bytes)

>8TB NSS Architecture



>16TB NCP - Overview

- Support for > 16TB File Access through NCP
 - Volume size information > 16TB volume
 - > 16TB User/Directory Quota
- Details
 - Novell® Clients have been modified to leverage new verbs
 - Size information expressed through 64-bit data type
 - Changes are backward compatible
 - File IO verbs already support 64-bit data types

DFS Junction Management

Manage Junctions

- Why do we need the Manage Junction Tool
 - No way to list the available junctions on a volume
 - Manage junctions only if you know where they are
 - Keep track of junctions manually.
- What is in Manage Junction Tool
 - New iManager Task “Manage Junctions” .
 - Scan volumes to locate junctions on them
 - Modify and Delete junctions.
 - Junction export to csv file.

Manage Junctions

- Scan each volumes once after upgrade
- Persistent cache of junction information
- Junction creation and modification tracked
- Works at volume level, iManager can select Volume, Server or Cluster.

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