Customer Issues and Solution

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NFS Industry Conference

Agenda

- Customer Issues

- Solution

- NFS v4 Client Support

- NetApp NFS v4 Roadmap

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Issue-NFS Security

- NFS data access is not secure

- Weak authentication

- No data encryption

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Issue-Poor Performance

Today,

- Enterprises are geographically distributed
- IP network speed is increasing

- **Poor performance over the WAN**
  - No Delegation

Issue-Data Migration

- Clients affected when moving the data between servers

- Difficult to migrate data from
    - AFS
    - DFS

Solution-Security

Secure environment by implementing GSS-API Framework in NFS v4:

- ## Kerberos V5 based authentication

  - Windows KDC
  - Solaris MIT KDC

- ## Integrity

- ## Privacy

  - Hardware accelerated IPSEC

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Solution-Performance

Improve performance by implementing the following NFS v4 features:

- Caching

- Delegation
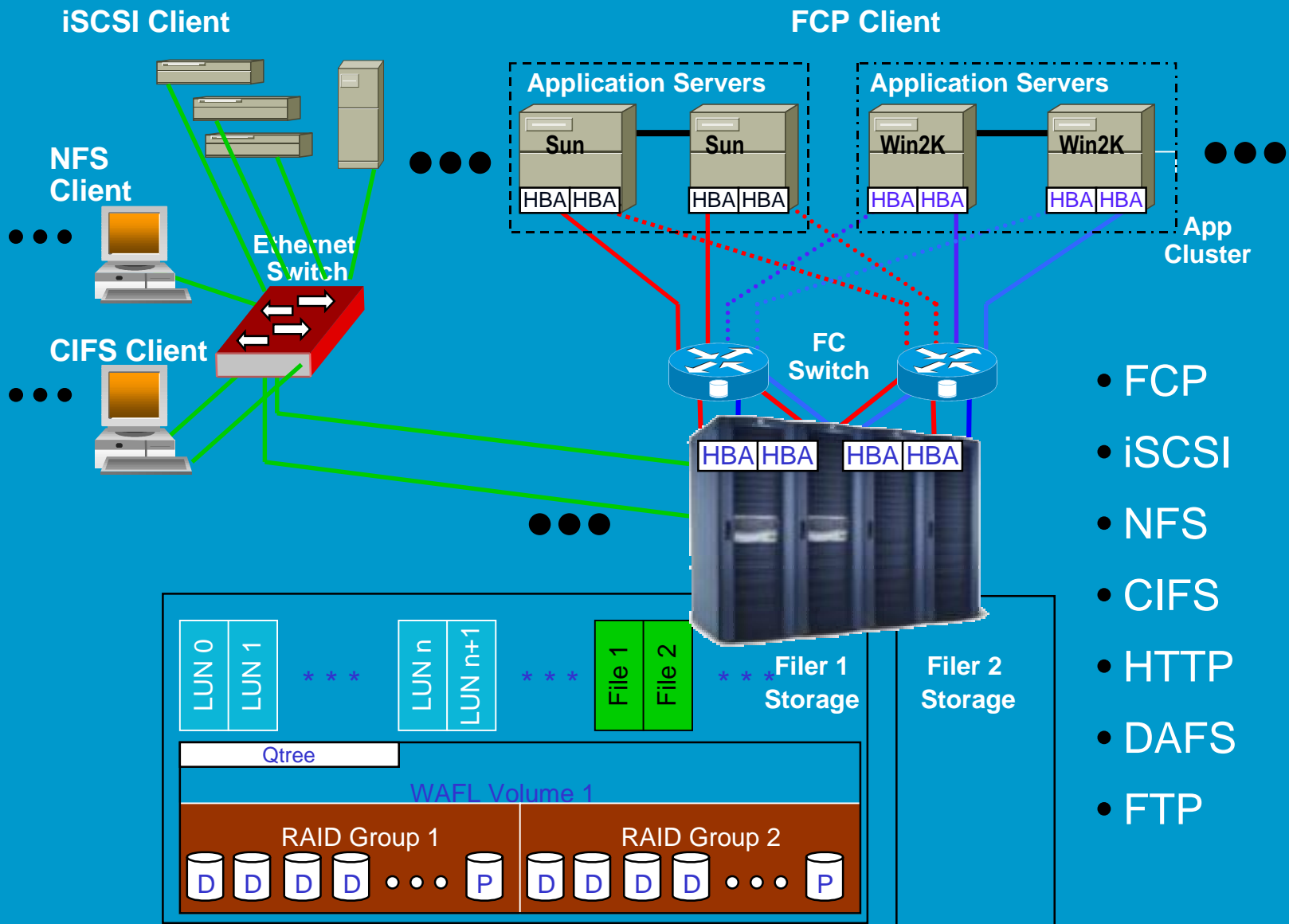
- Compounding RPC

- Replication

- DNFS

Solution-Migration & Replication

Simplify data management and reduce administration cost by:

- Global data sharing

- Move data without affecting clients

Multiprotocol Solution

iSCSI Client

FCP Client

Application Servers
Sun   Sun
HBA HBA   HBA HBA

Application Servers
Win2K   Win2K
HBA HBA   HBA HBA

App Cluster

NFS Client

Ethernet Switch

CIFS Client

FC Switch

HBA HBA   HBA HBA

LUN 0 LUN 1   LUN n LUN n+1   File 1 File 2   Filer 1 Storage   Filer 2 Storage

Qtree

WAFL Volume 1

RAID Group 1   RAID Group 2

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- FCP
- iSCSI
- NFS
- CIFS
- HTTP
- DAFS
- FTP

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NFS V4 Client support

NetApp pro-actively working with following developers of NFS v4 client implementations:

- Linux

- Various Unix Vendors

- Windows

Product Release Plans

- Partners Release

  – End of year 2002

- Beta Customer Release

  – End of year 2002

- First Customer Ship

  – First half of year 2003

- Follow – on release with additional features

  – End of year 2003

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