hp
invent

managing unpredictable storage demands

magdy assem

solutions marketing manager
network storage solutions organization
hewlett-packard

how much…

…information is stored in the world?

…12,000 PB in the world

…information can the human brain hold at any given time?

…200MB per human

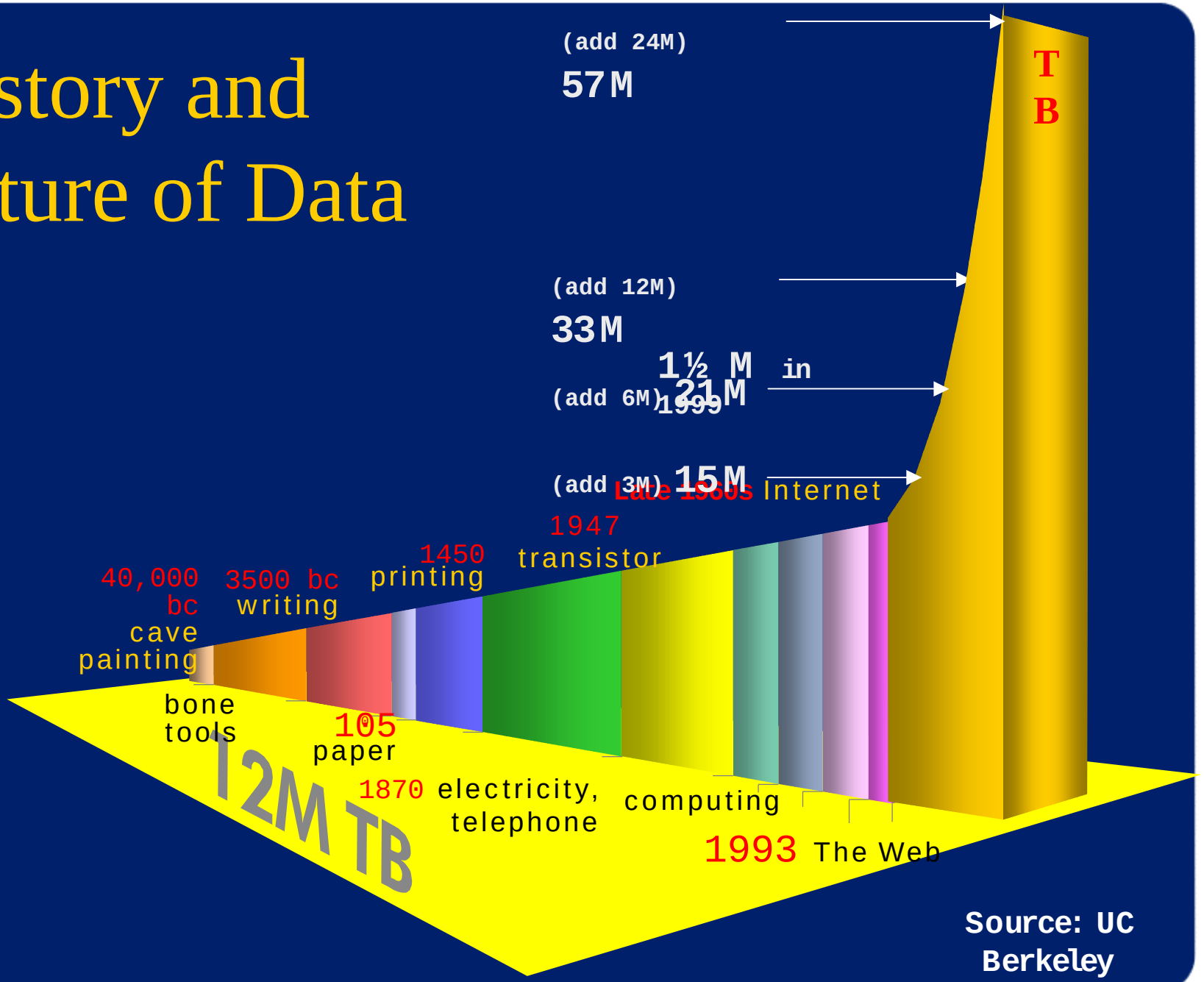
…storage exists in human memory?

…1,200 PB in human memory

…storage is needed to store one human's lifetime memory?

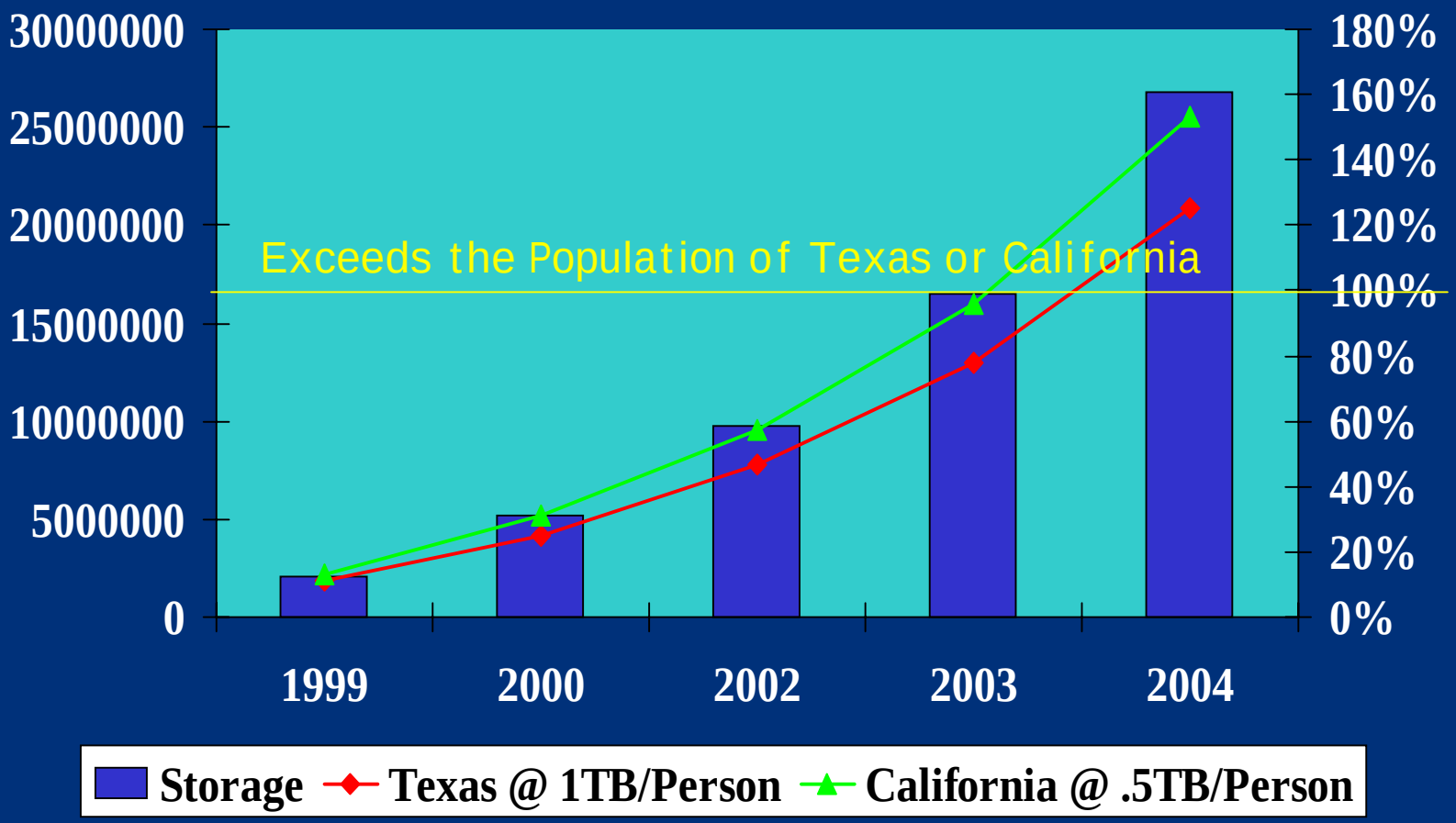
…2GB per person/lifetime

History and Future of Data



Source: UC Berkeley

the growth of storage managers



hp storage strategy:

federated storage

physically separate domain(s), types and vendors of networked storage devices that operate as one logical resource

storage area management

"SAM is the centralized management of resources and data across a storage domain(s), providing shared services to a group of servers and their applications"

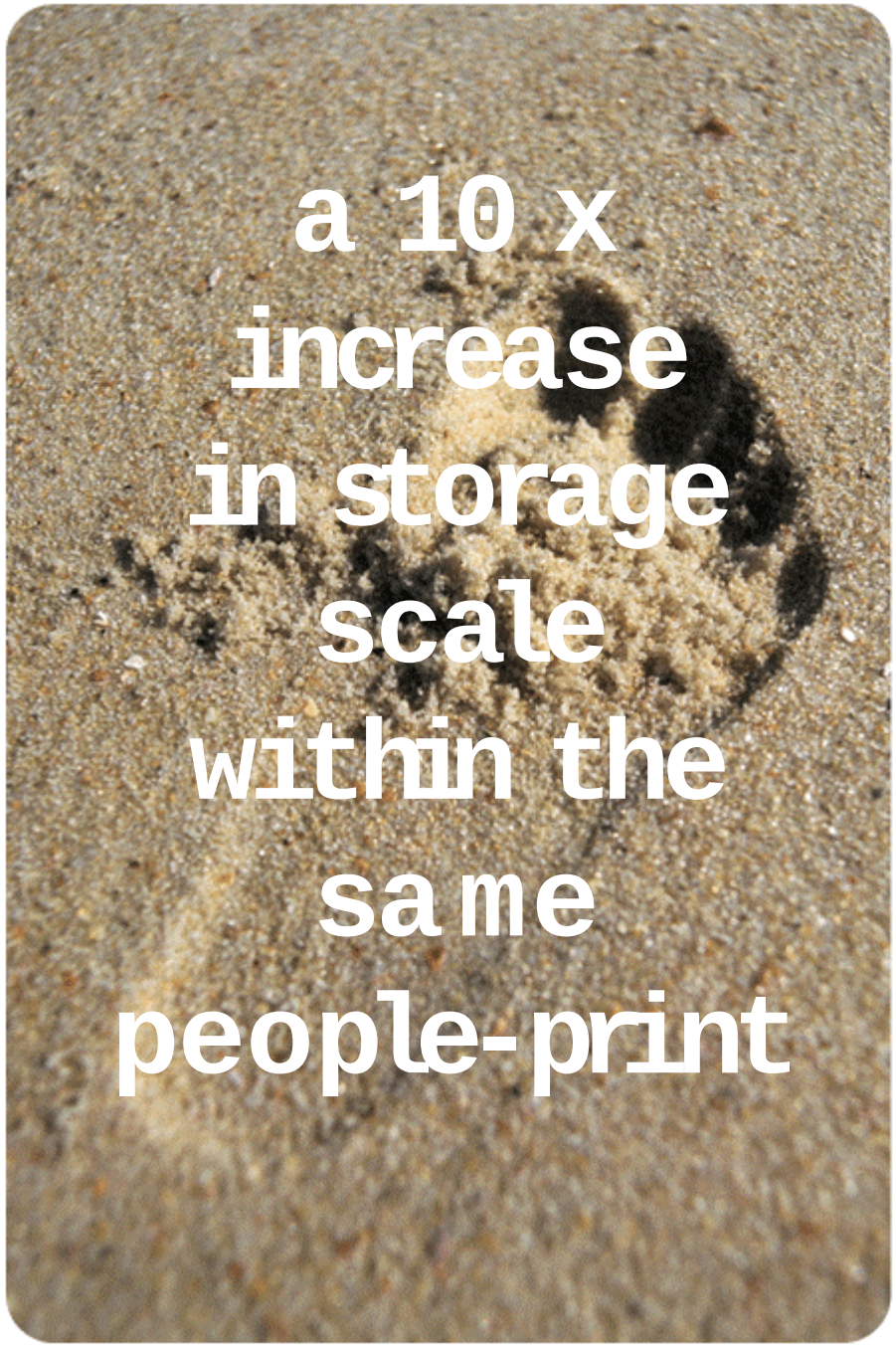
-- Gartner Group

federated storage area management (Fsam)

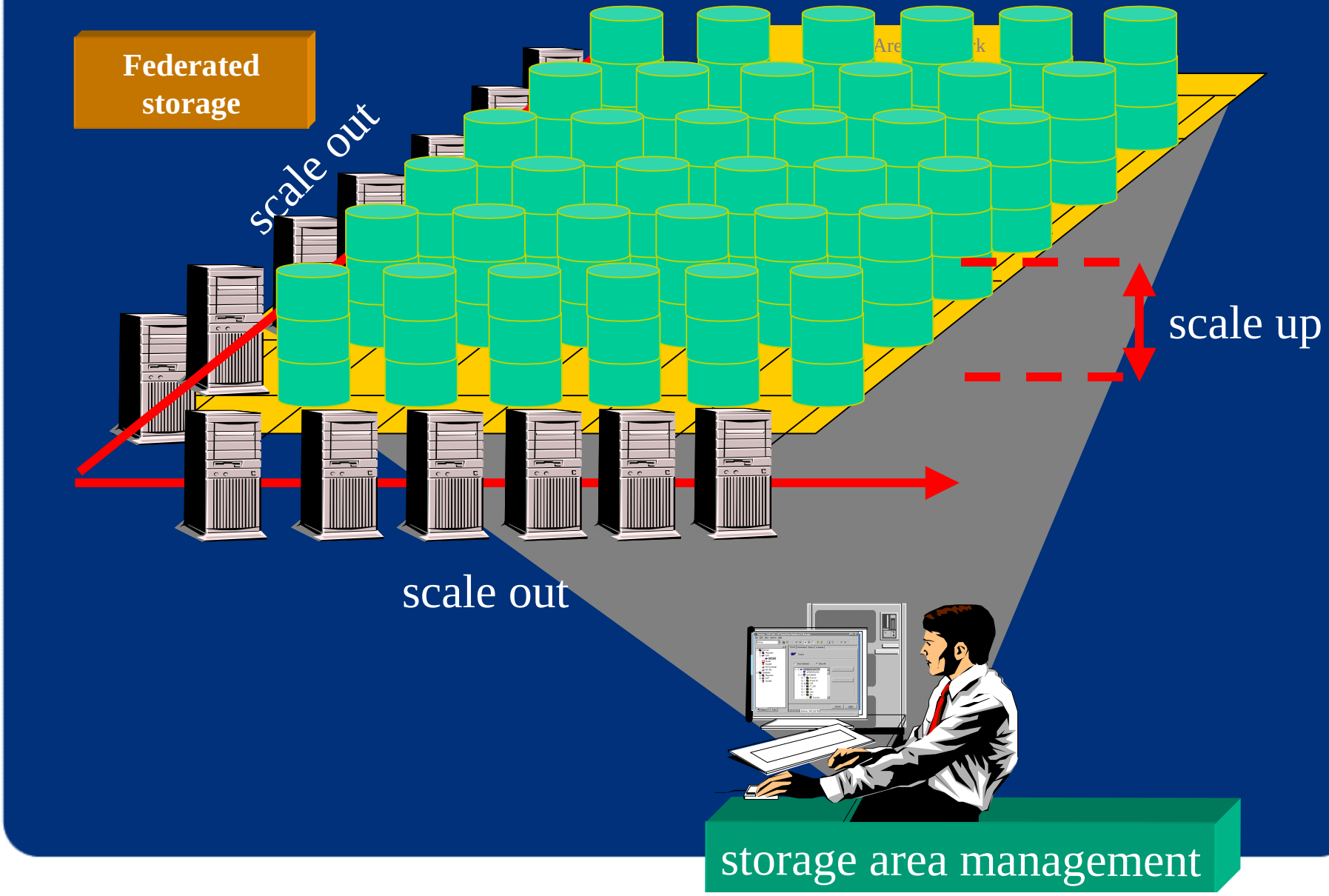
a ten-fold more efficiently administered network of modular storage appliances that, when integrated with storage area management software, subsystems and services, creates a naturally scalable environment of federated storage resources

the attributes

- responsive
- elastic
- mobile
- persistent
- innocuous
- visible
- economical
- automated
- safe and secure
- always-on



scaling federated storage



scalable
federated
storage
infrastructure

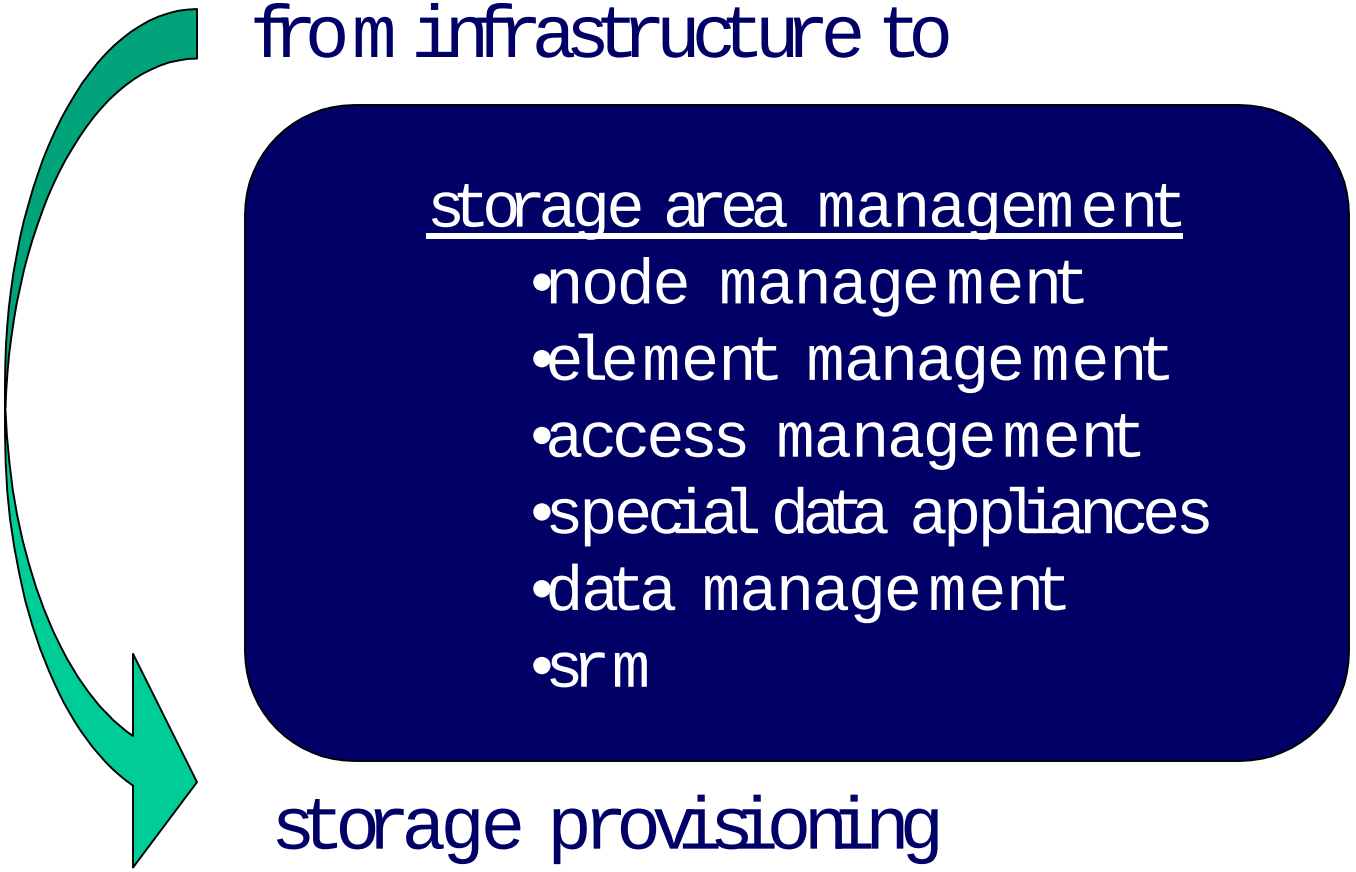
scale-up …..
more storage per device

scale-out ……
more devices per
application

storage area management

- node, access and element management
- data management
- data appliances
- srm
- automated storage provisioning

… resulting in a 10x
more efficiently
administered network of
modular networked
storage


from infrastructure to
storage area management
•node management
•element management
•access management
•special data appliances
•data management
•srm
storage provisioning

federated storage infrastructure

remote applications data

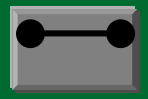
applications

single pane of glass

special purpose data appliance

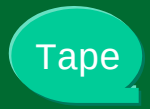
management appliance

fabric

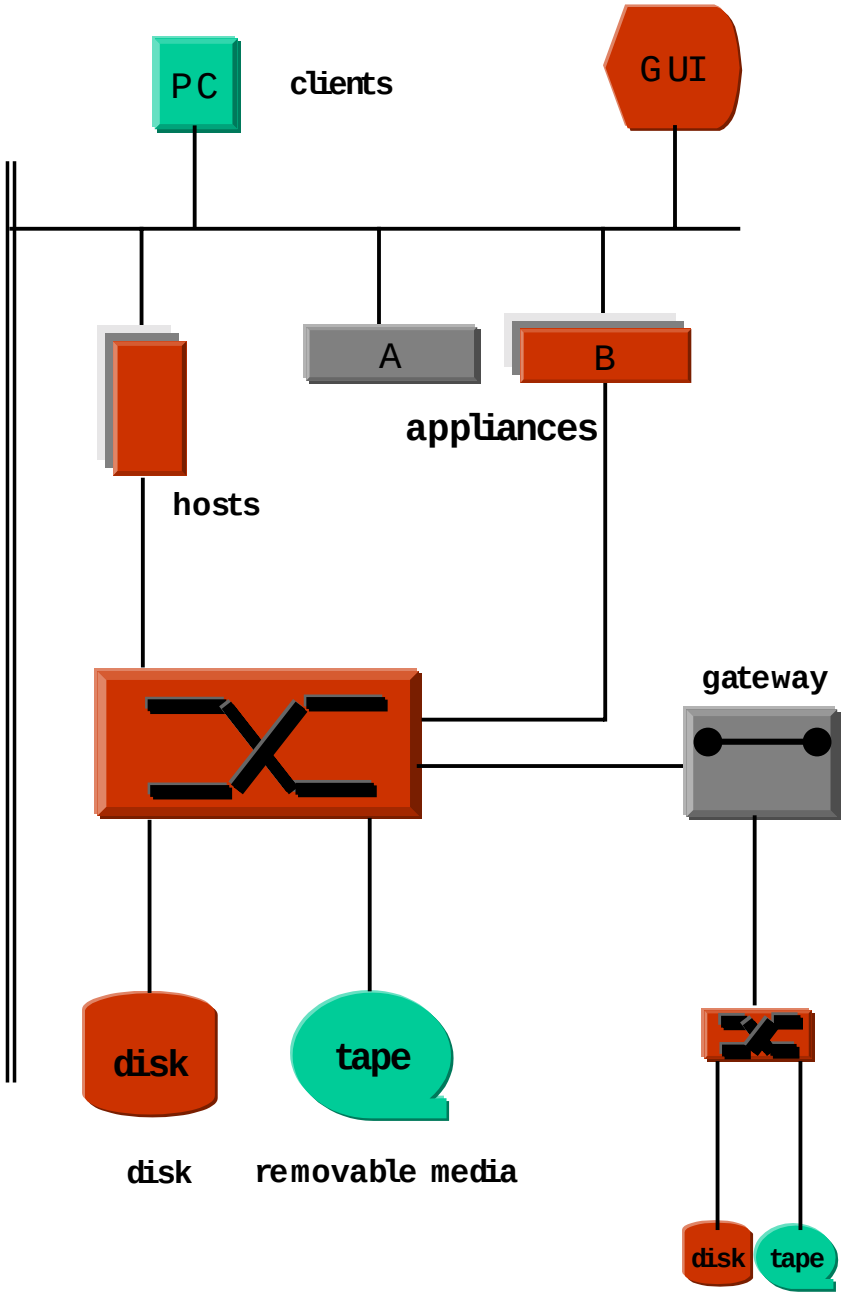


wan-man gateway

disk resource



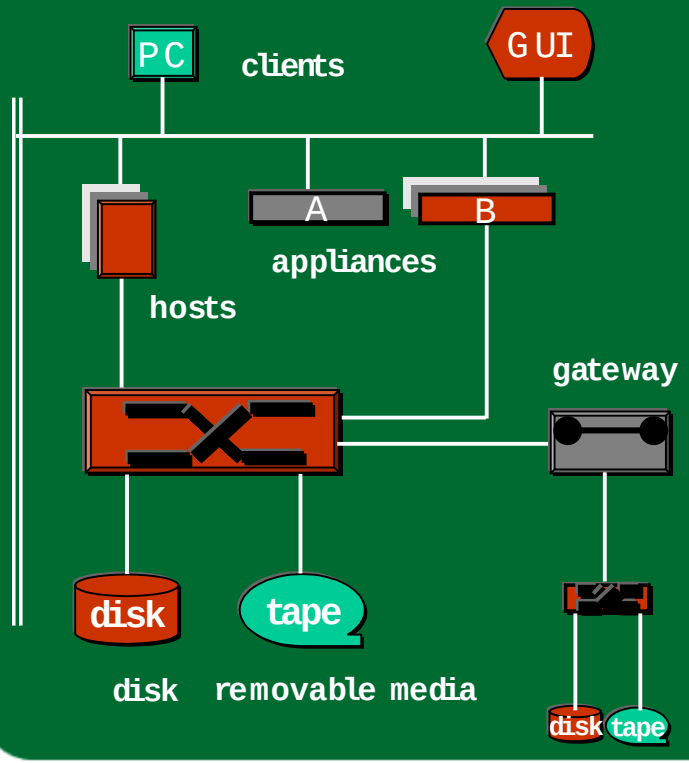
removable media resource

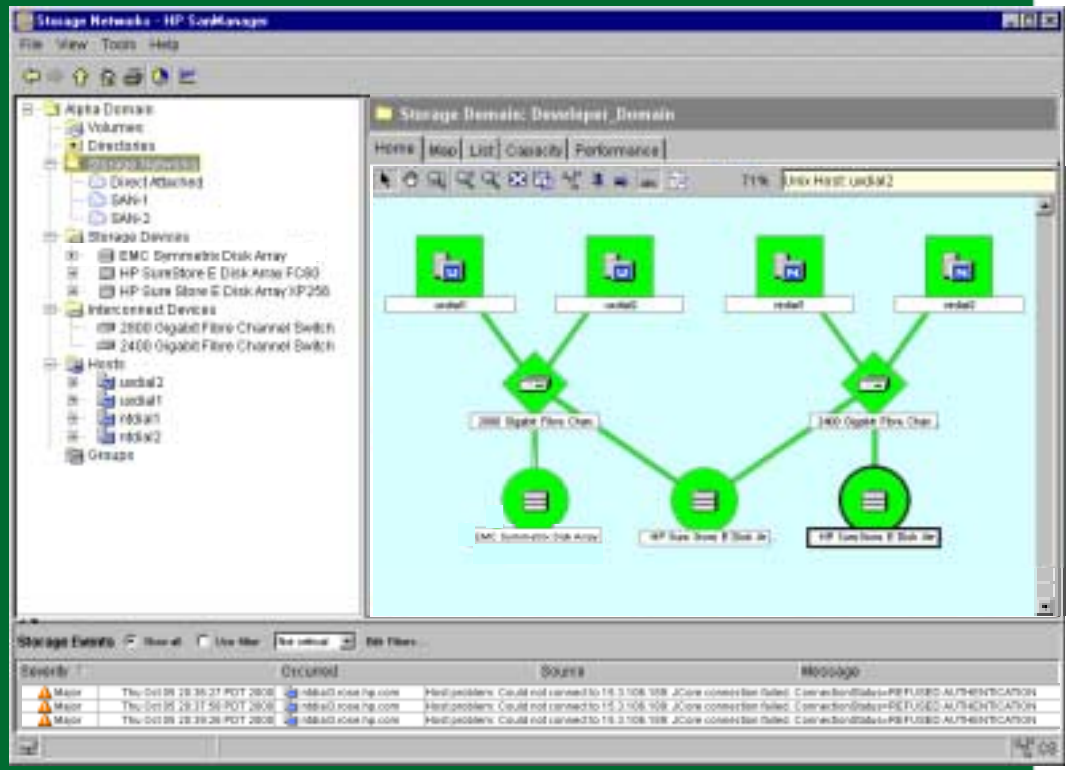


node management

GUI single pane of glass

SNM discover, map, launch:
direct attach & network elements

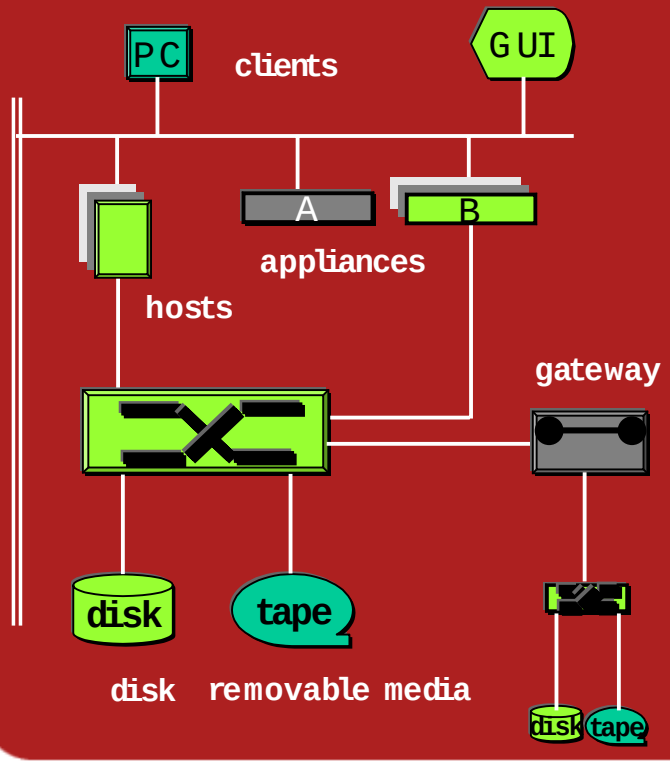


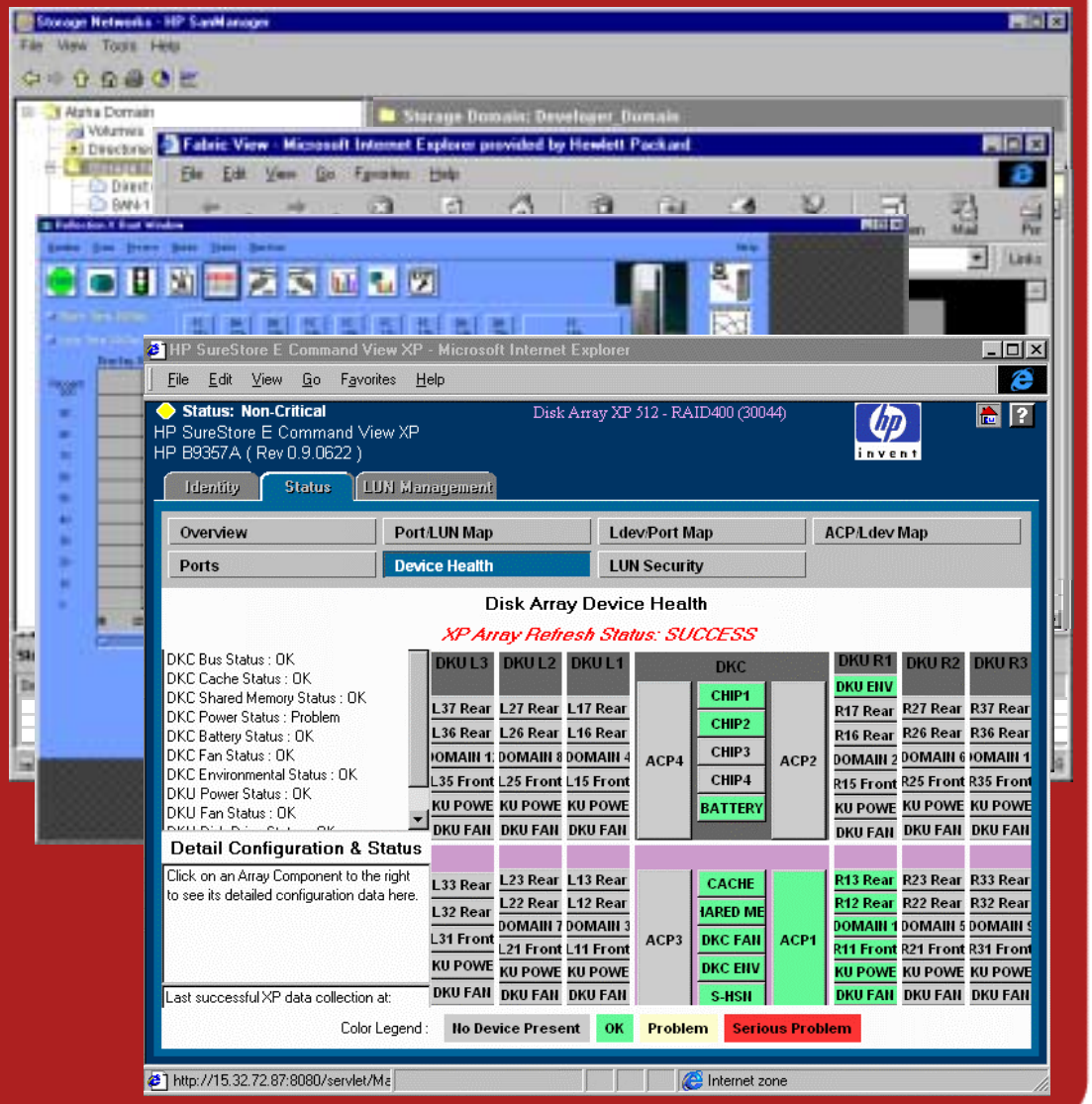


element management

GUI single pane of glass

SNM storage node manager: element management





access management

allocater

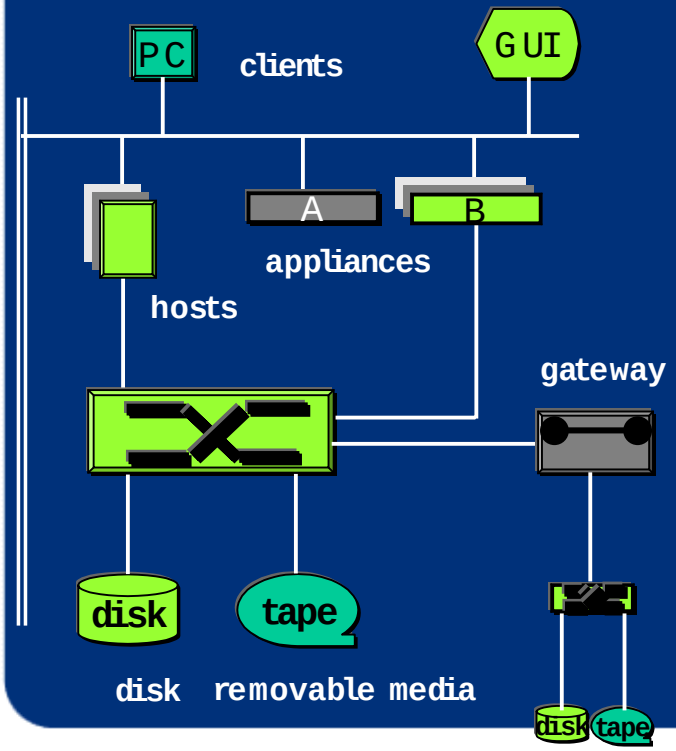
any-any device access mapping:
- boot-free drag and assign storage
- visible to volume manager and file system
- fabric & device independent

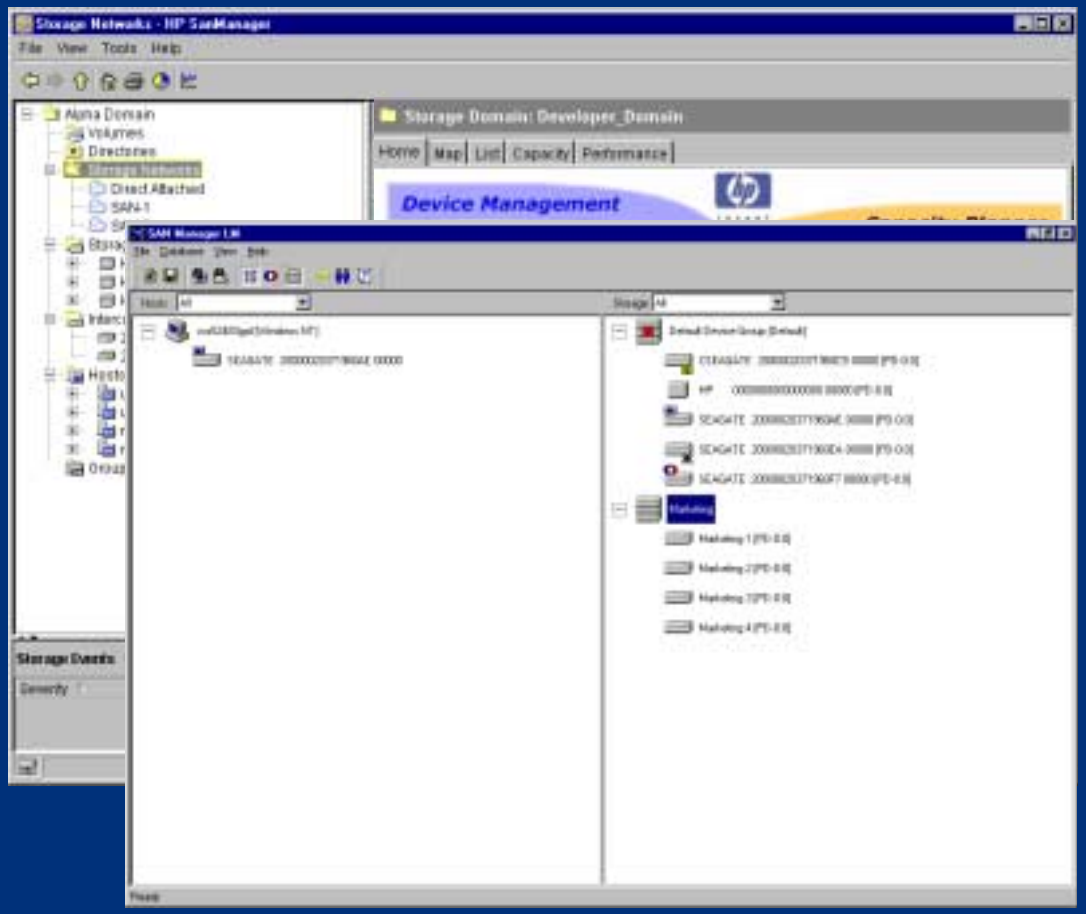
GUI

single pane of glass

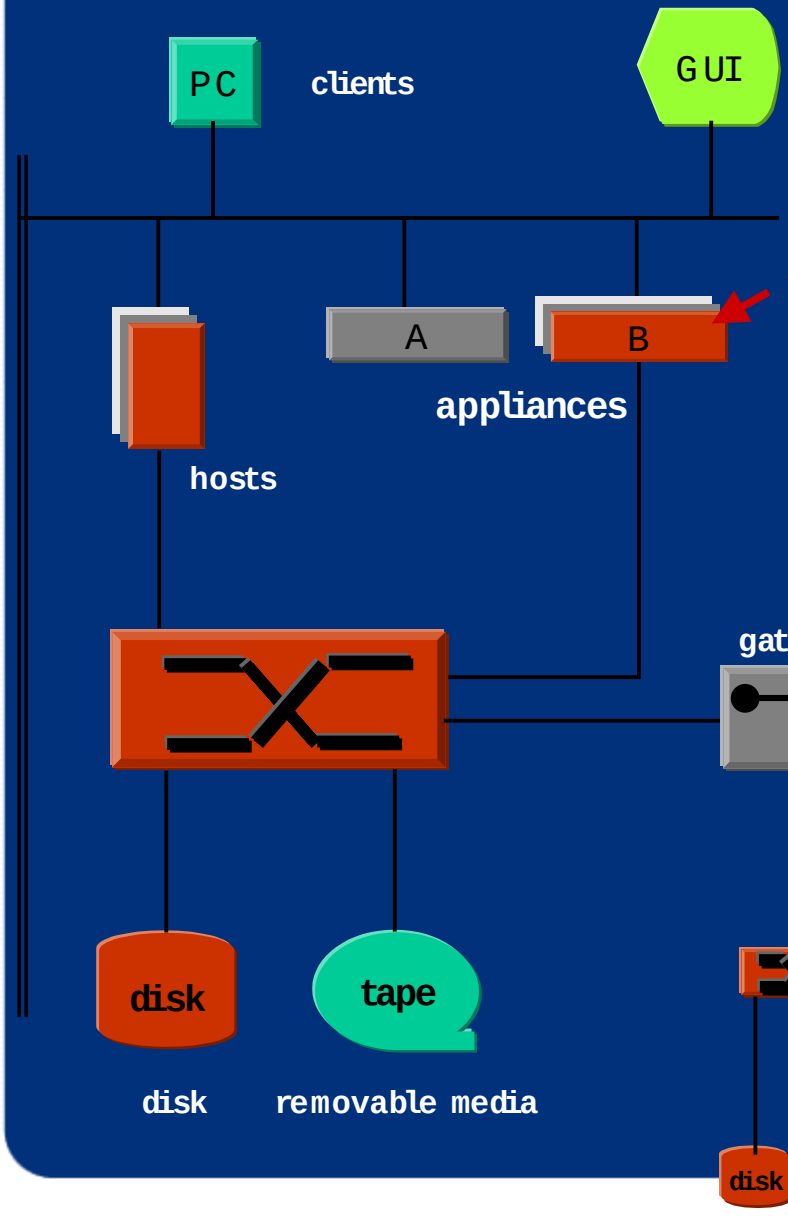
snm

storage node manager:
element management





special data appliance: nas



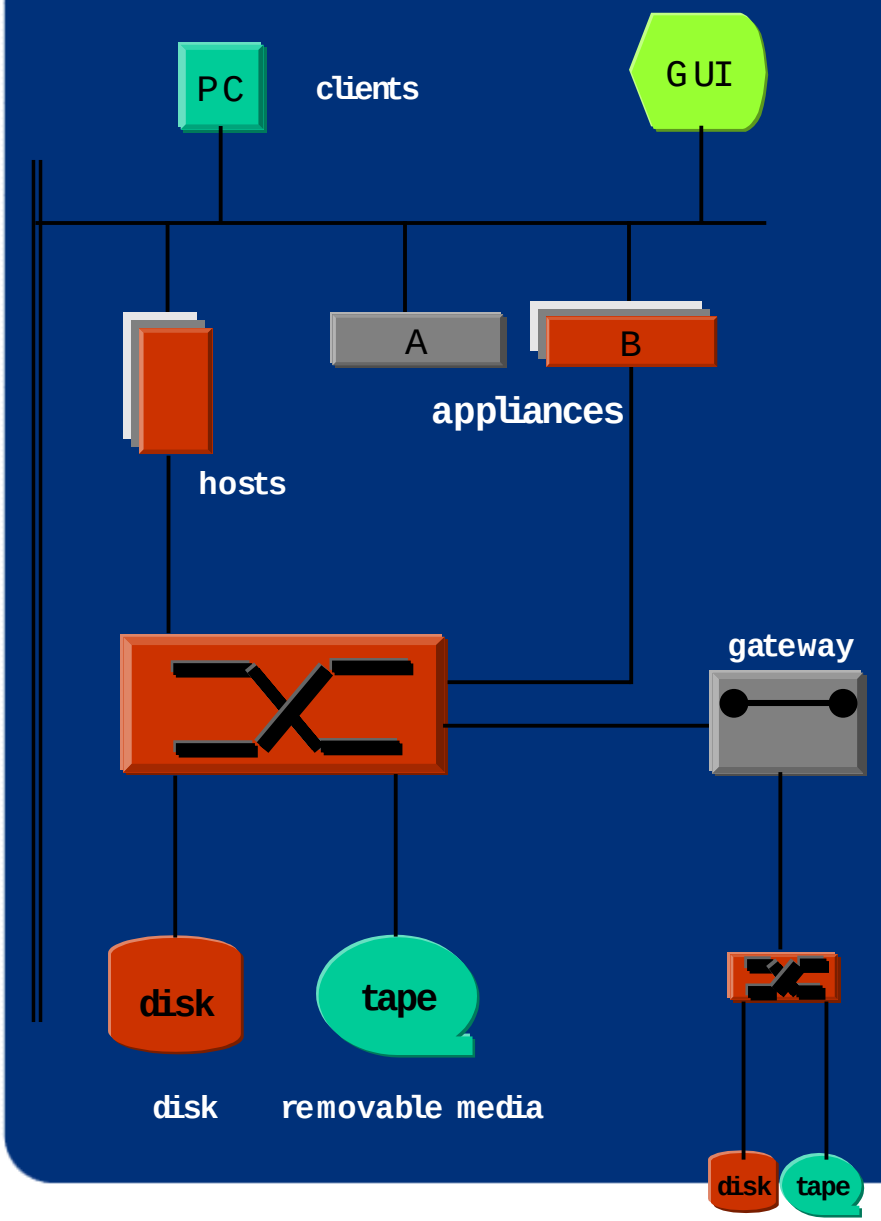
NAS head:
- plug-n-play
- high performance
- integrated network data protection
- elastic storage

any-any device access mapping:
- boot-free drag and assign storage
- visible to volume manager and file system
- fabric & device independent

single pane of glass

storage node manager:
element management

data management



NDMA

network data management appliance:
- plug-n-play
- manage source –destination moves & copies
- manage xcopy
- manage removable devices
- replication management

PC NAS

server, desktop & mobile clients
- file system agents

allocater

any-any device access mapping:
- boot-free drag and assign storage
- visible to volume manager and file system
- fabric & device independent

GUI

single pane of glass

snm

storage node manager:
element management

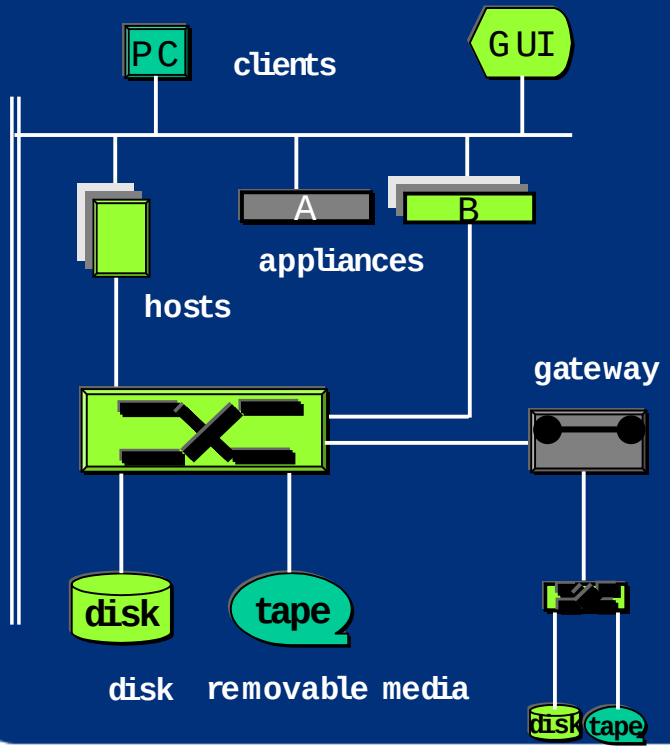
srm :optimizing and building storage

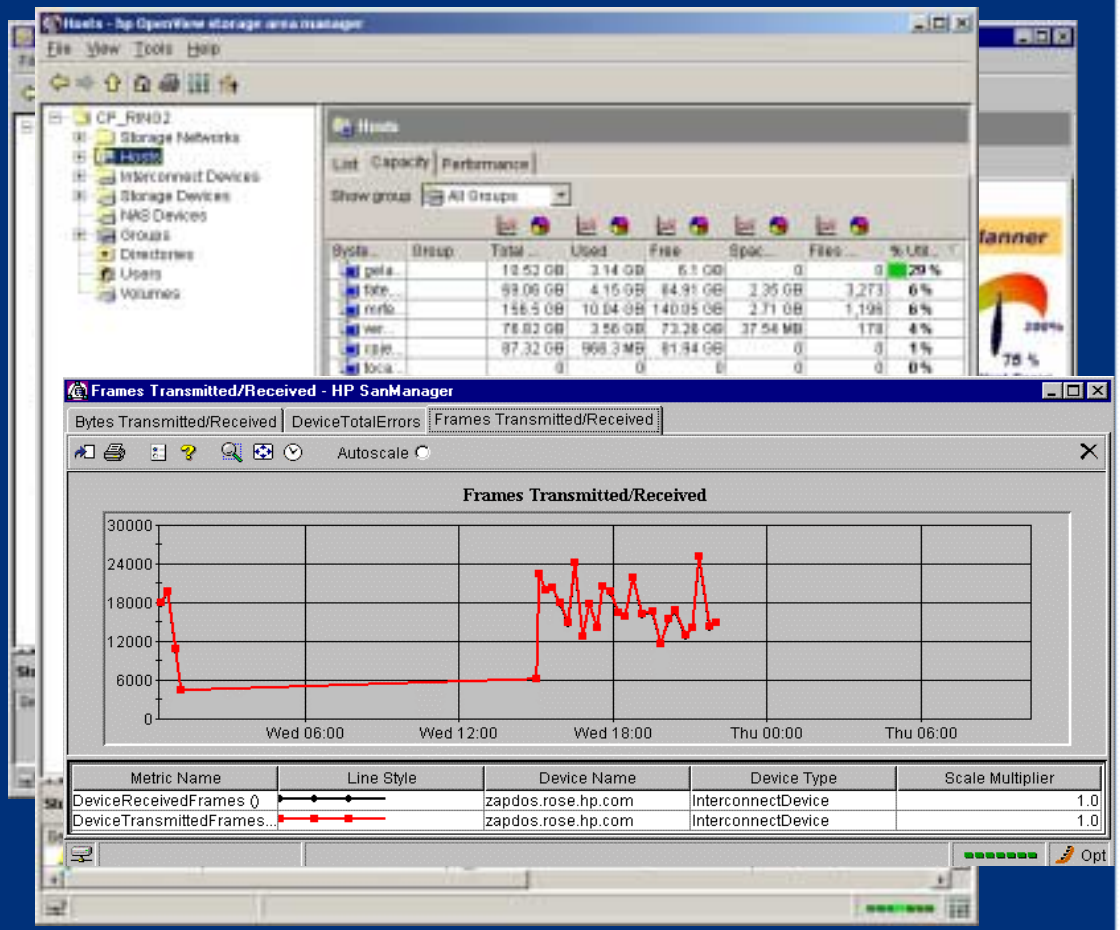
snm

- tools for assessment, control and planning of storage resources
- monitors the performance of the entire SAN including hosts, infrastructure, and storage.

GUI

single pane of glass



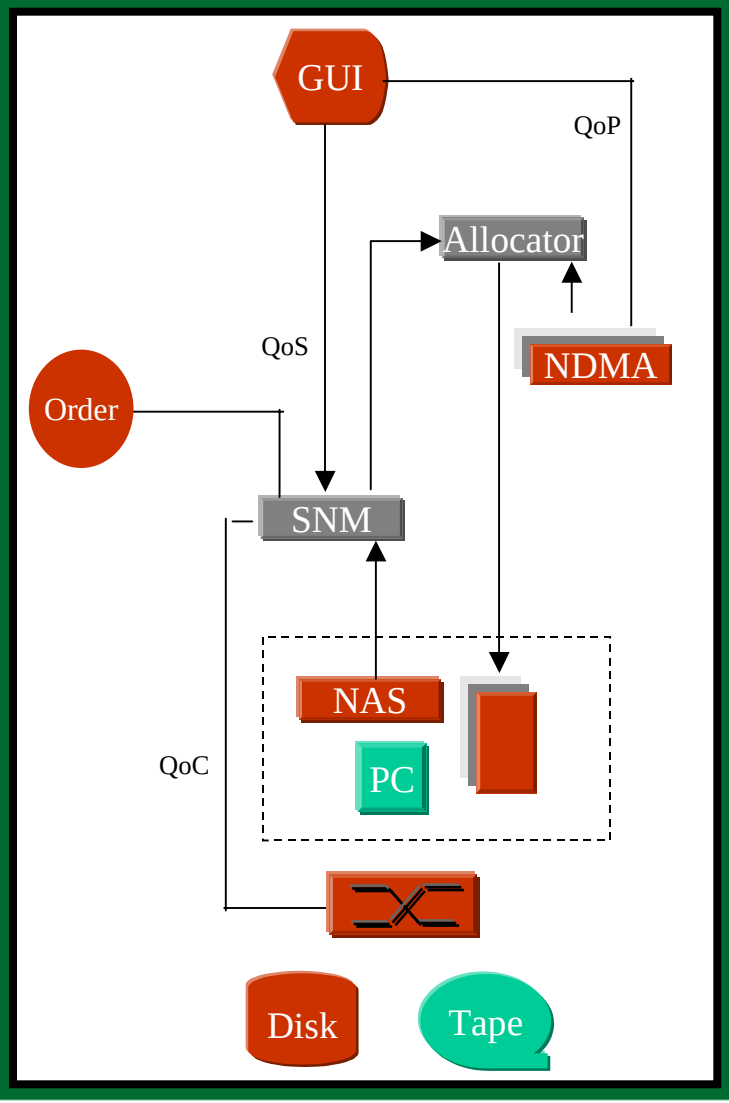


automated storage provisioning

Allocate/de-allocate storage

•Provision Data Management resources and connections

Monitor storage usage & capacity



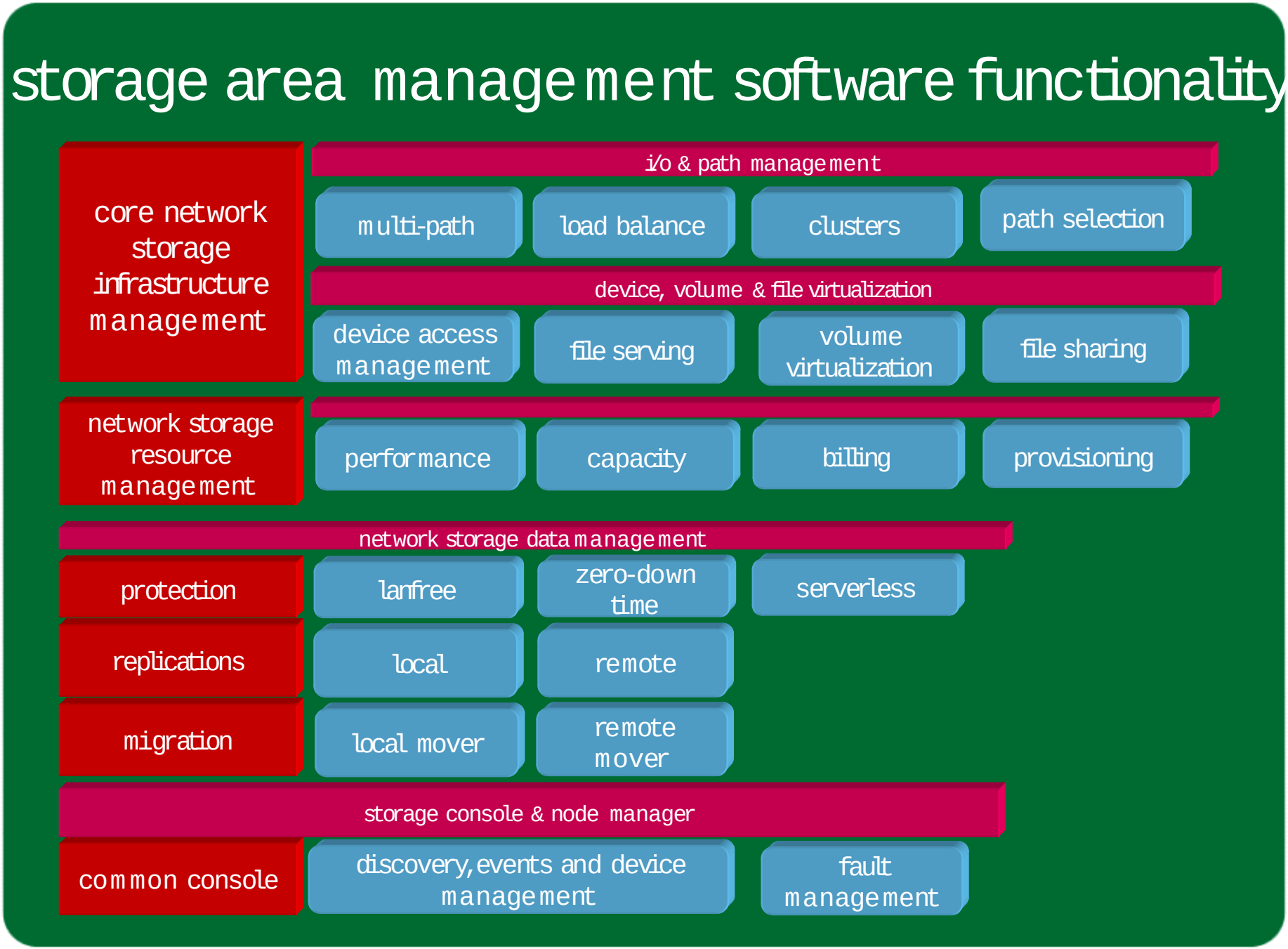
Set policy & watermarks

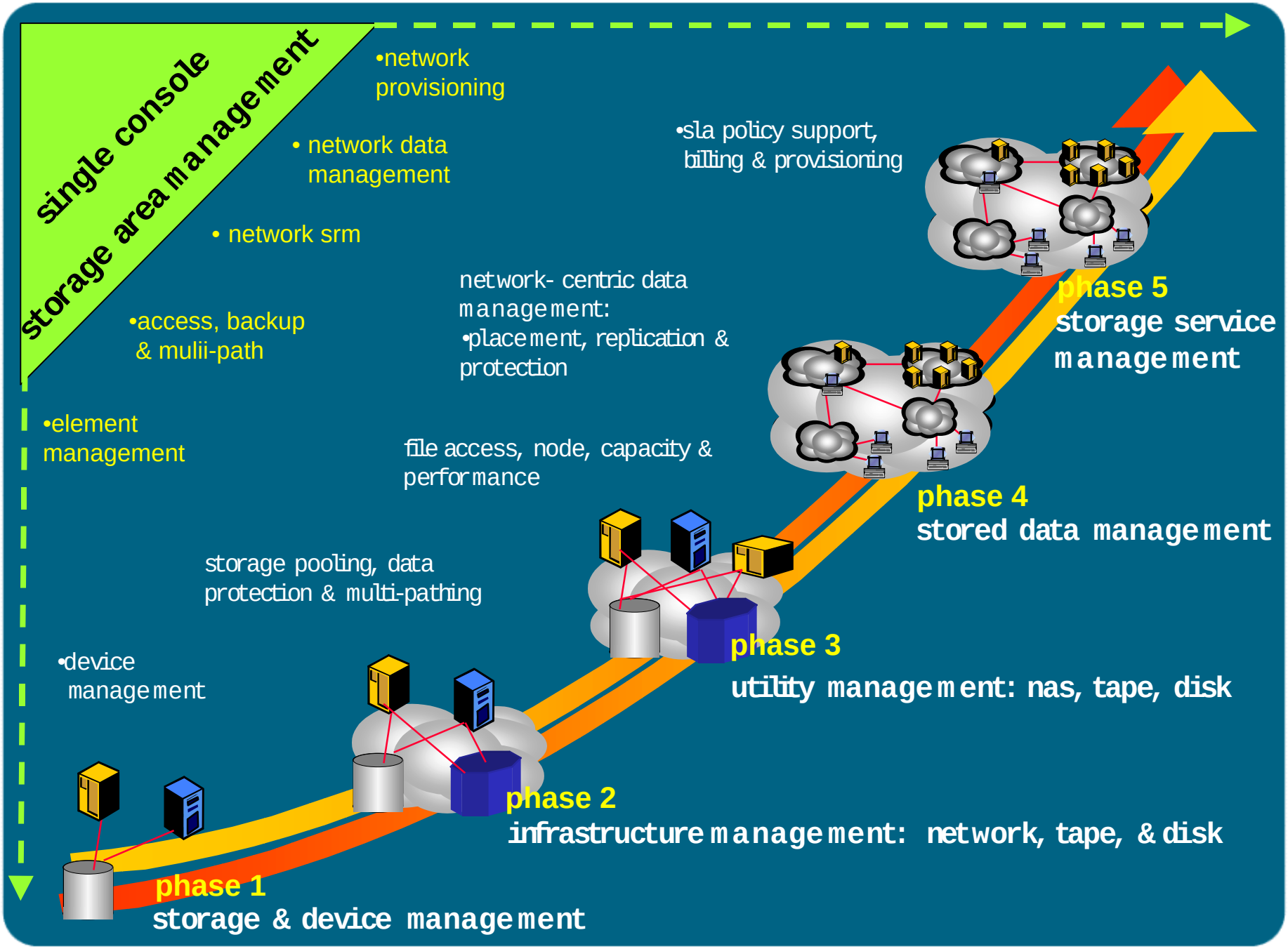
•QoC: Quality of Connection
•QoS: Quality of Service
•QoP: Quality of Protection

•Manage data changes

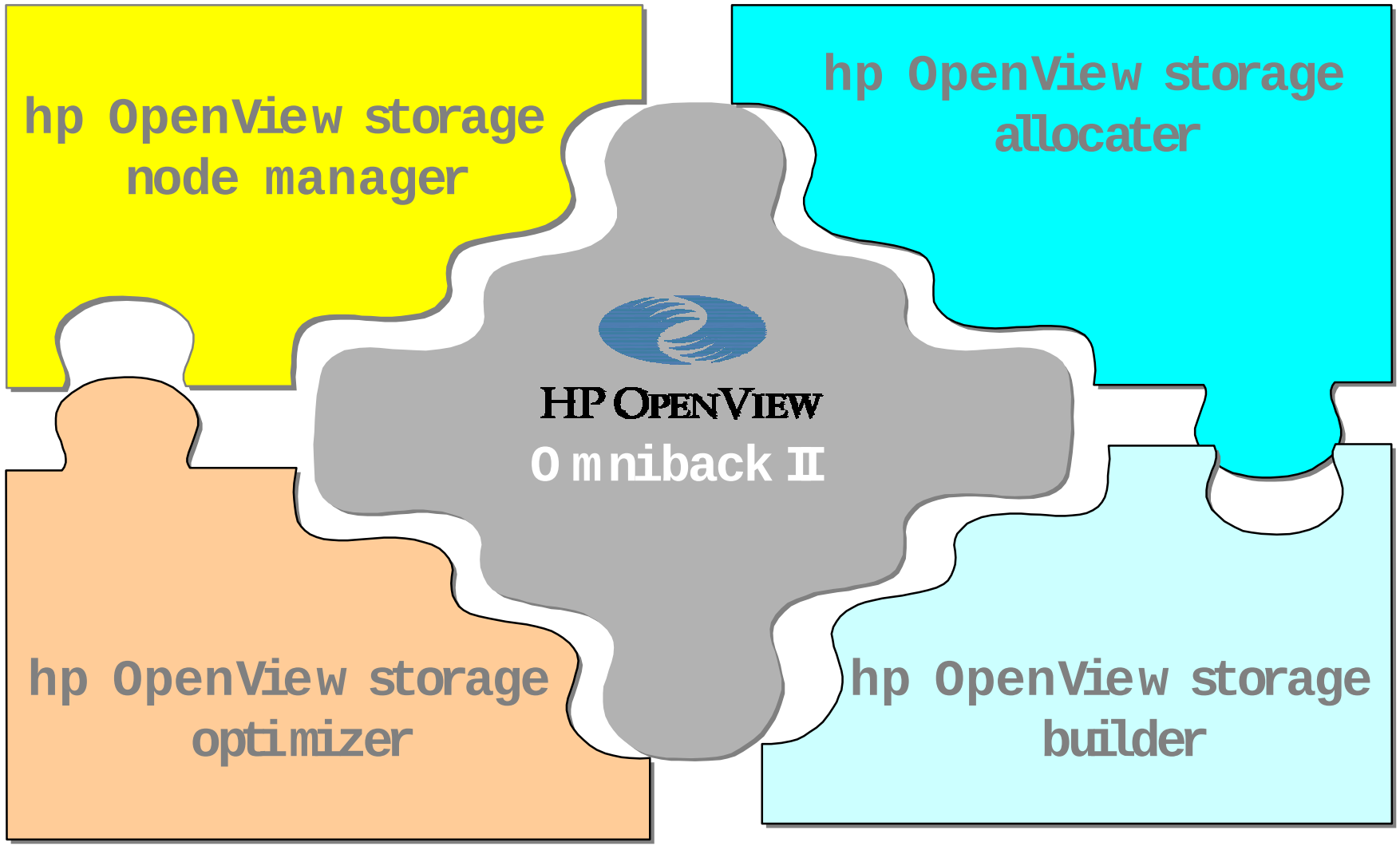
Applications use storage

storage area management software functionality




single console
storage area management
•network provisioning
• network data management
• network srm
•sla policy support, billing & provisioning
network- centric data management:
•placement, replication & protection
•access, backup & mulii-path
•element management
file access, node, capacity & performance
storage pooling, data protection & multi-pathing
•device management
phase 5
storage service management
phase 4
stored data management
phase 3
utility management: nas, tape, disk
phase 2
infrastructure management: network, tape, & disk
phase 1
storage & device management

available today - SAM



hp
invent