



i n v e n t

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?

... 200 MB per human

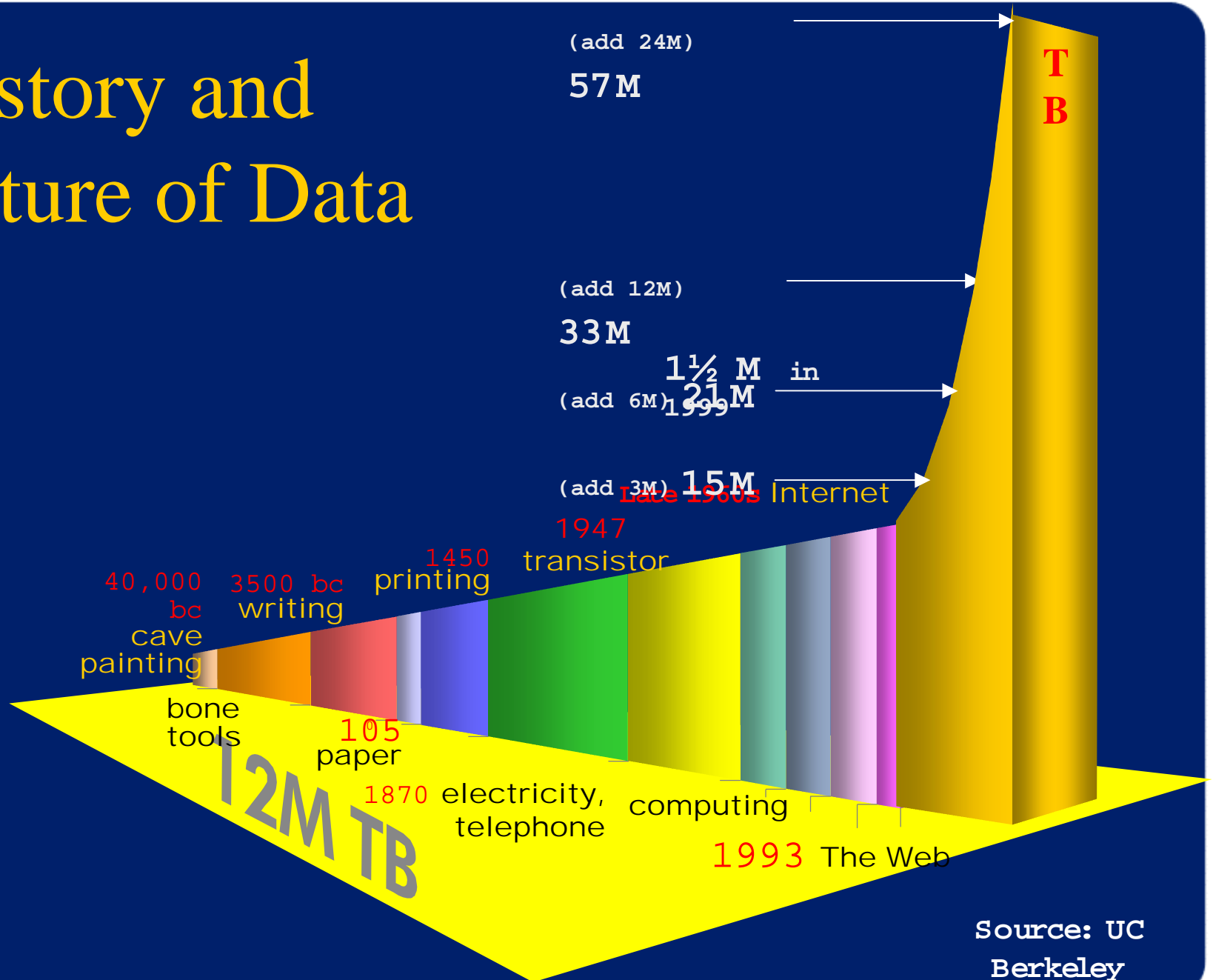
...storage exists in
human memory?

... 1,200 PB in human memory

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

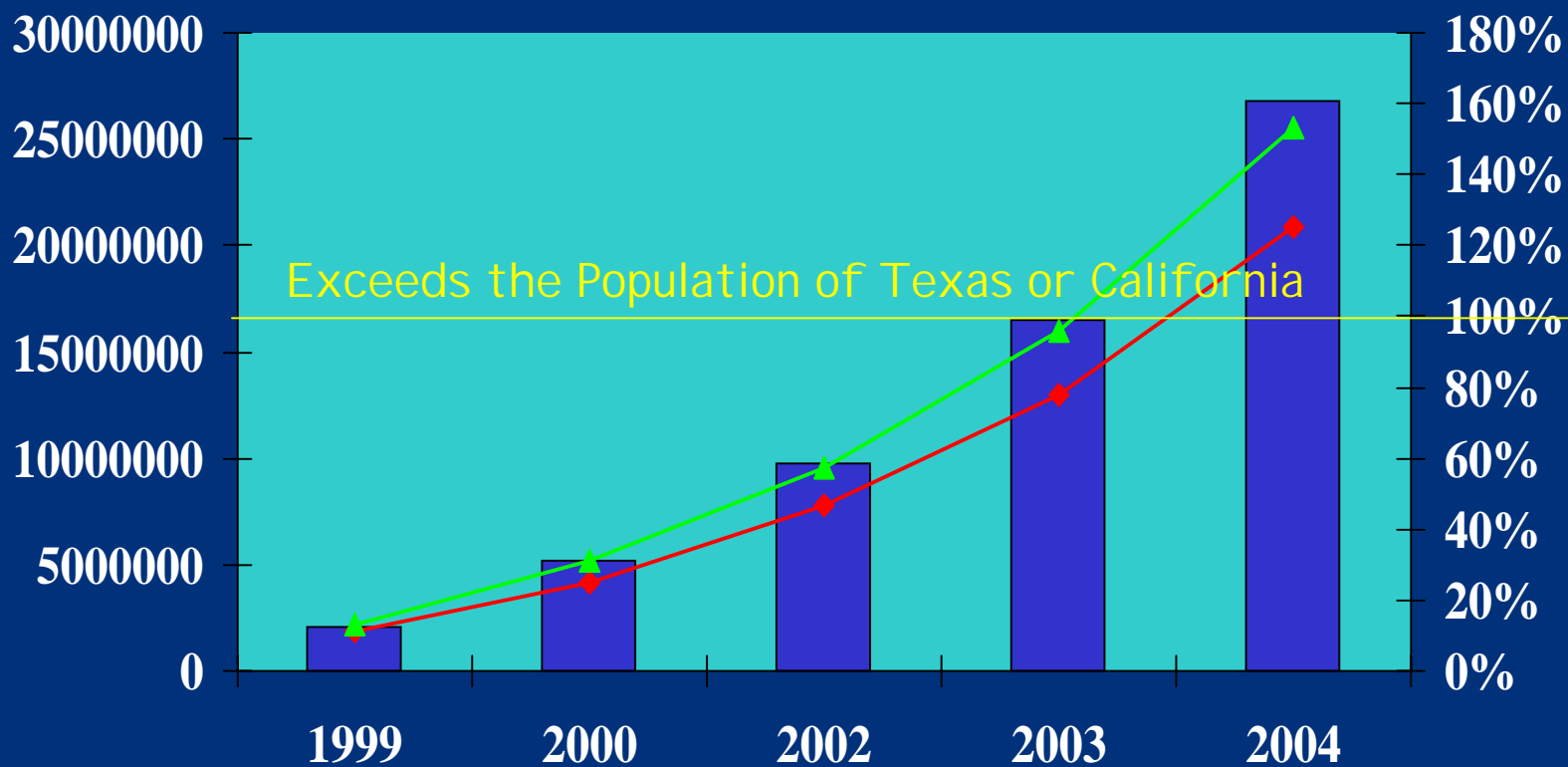
... 2GB per person/lifetime

History and Future of Data



Source: UC Berkeley

the growth of storage managers



■ Storage ◆ Texas @ 1TB/Person ▲ California @ .5TB/Person

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"

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

-- Gartner Group

the attributes

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



a 10 x
increase
in storage
scale
within the
same
people-print

scaling federated storage

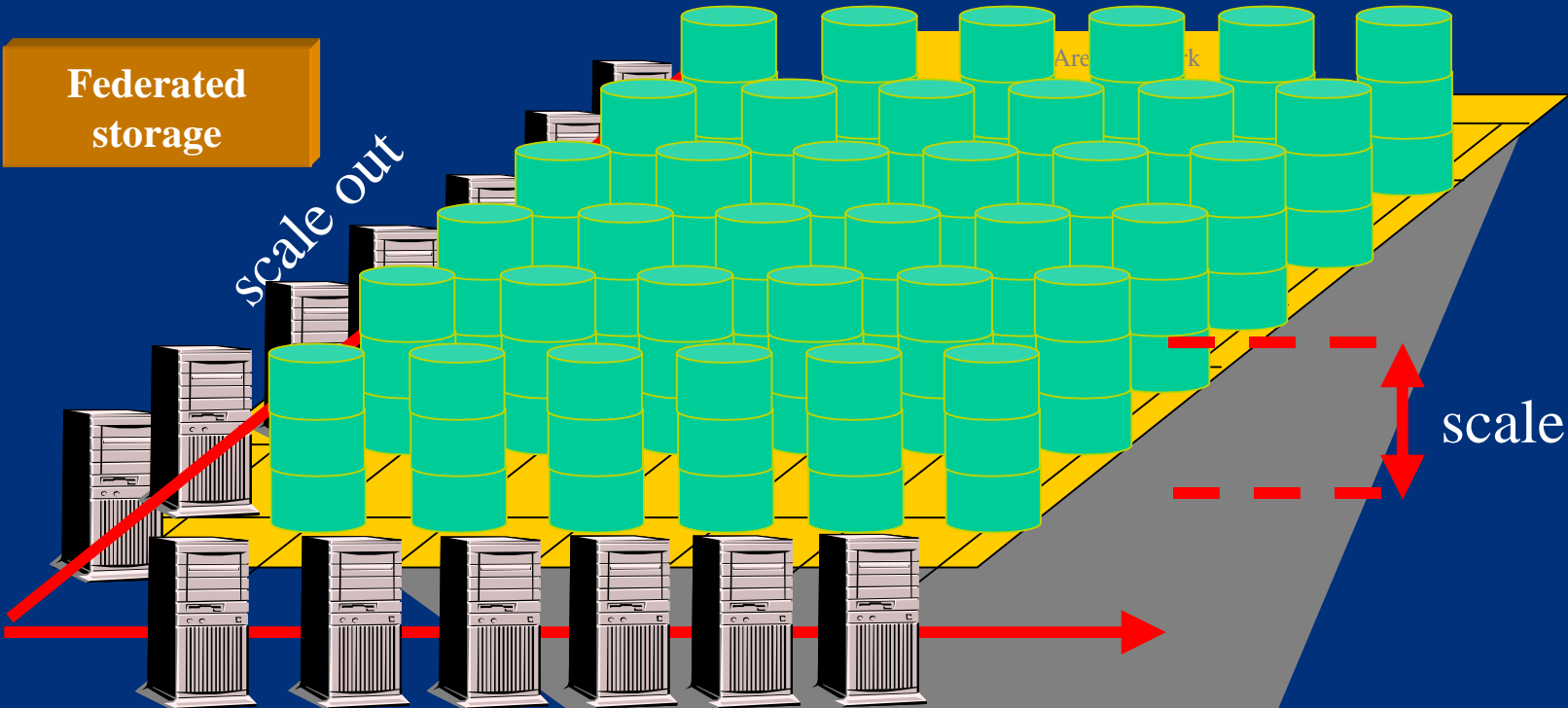
Federated storage

scale out

scale up

scale out

storage area management



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

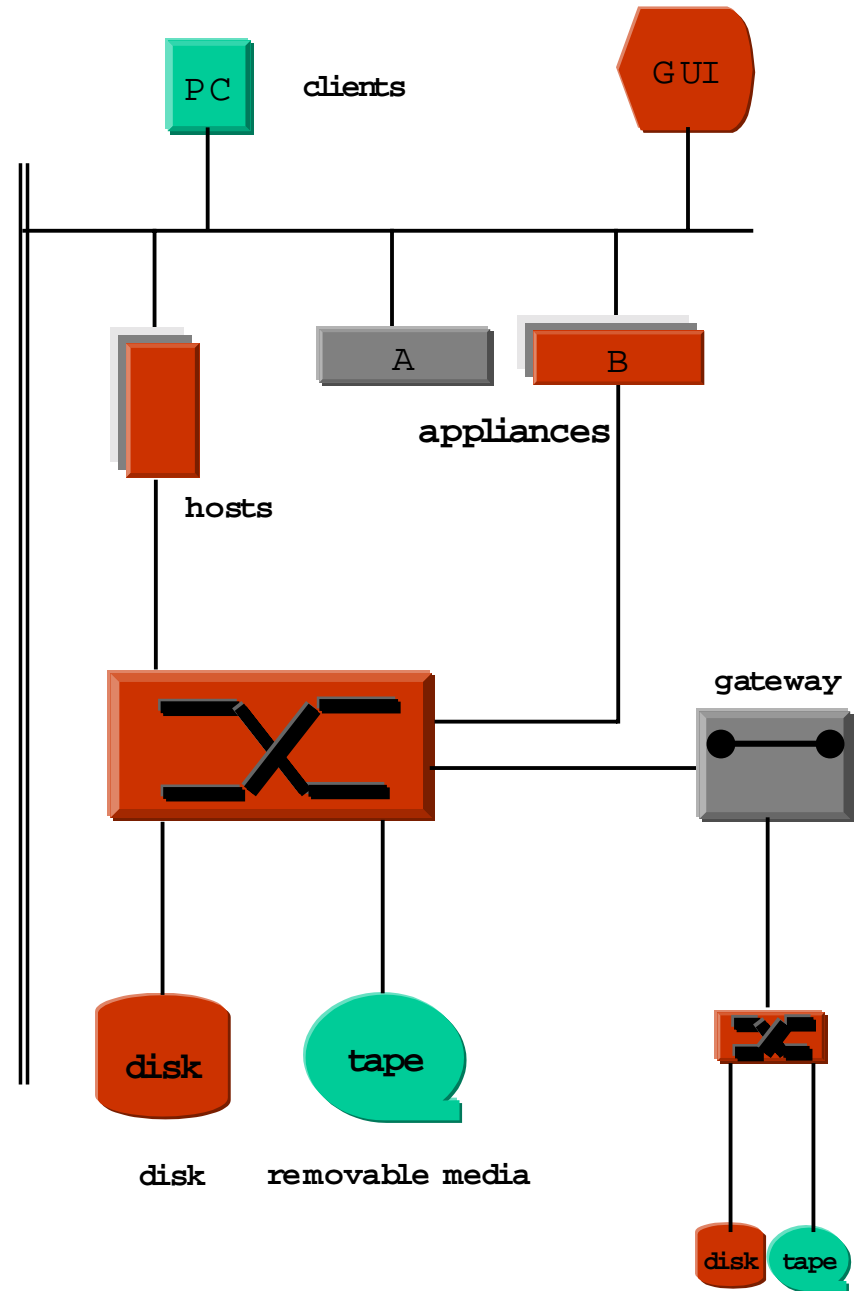
storage area management

- 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



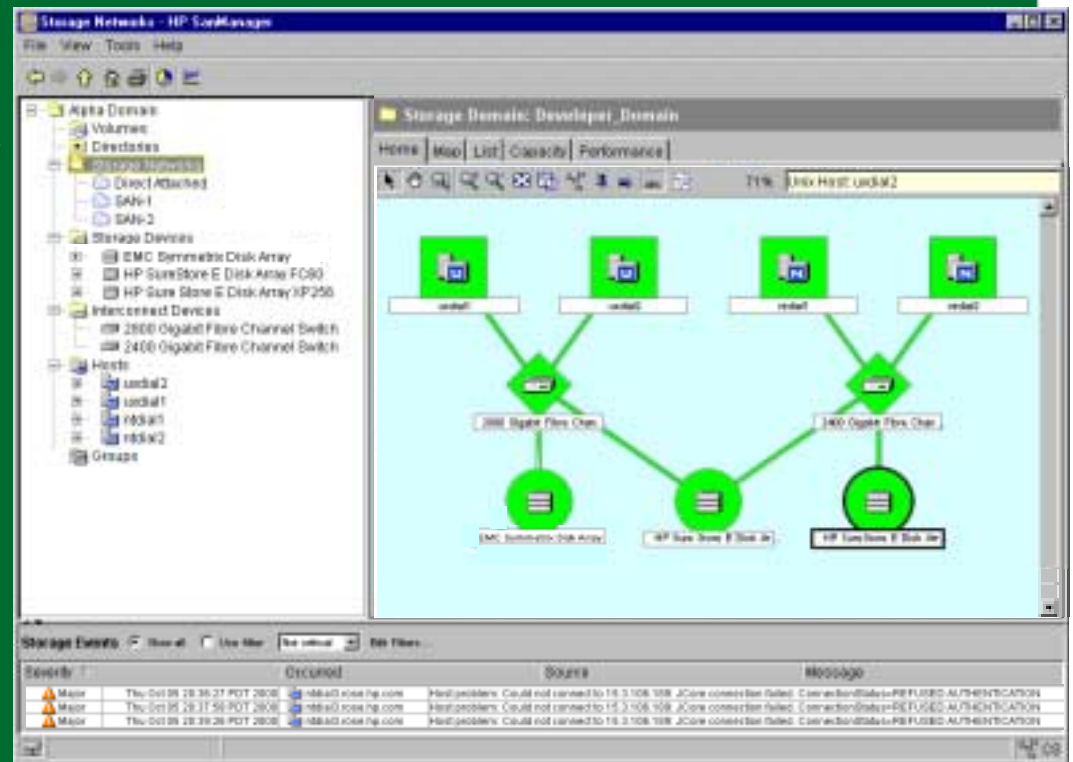
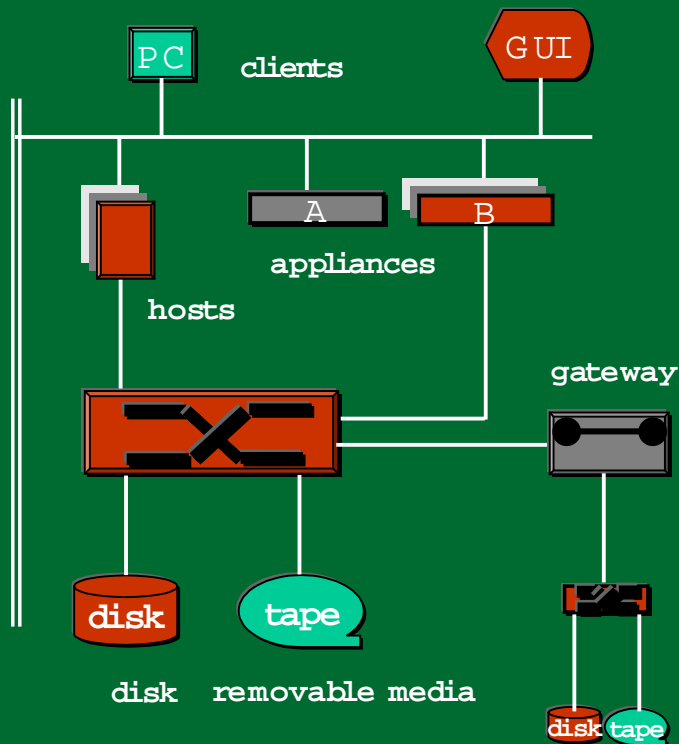
node management

GUI

single pane of glass

SNM

discover, map, launch:
direct attach & network elements



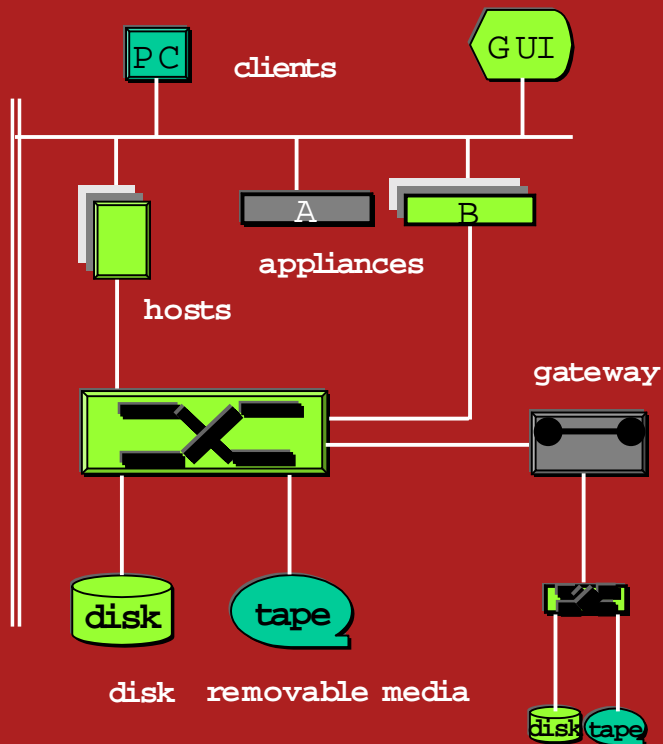
element management

GUI

single pane of glass

SNM

storage node manager:
element management



The screenshot shows the HP SureStore E Command View XP web interface. The status is 'Non-Critical'. The interface includes tabs for Identity, Status, and LUN Management. The 'Disk Array Device Health' section displays the following information:

Disk Array Device Health
XP Array Refresh Status: SUCCESS

DKC Bus Status : OK
 DKC Cache Status : OK
 DKC Shared Memory Status : OK
 DKC Power Status : Problem
 DKC Battery Status : OK
 DKC Fan Status : OK
 DKC Environmental Status : OK
 DKU Power Status : OK
 DKU Fan Status : OK

DKU L3	DKU L2	DKU L1	DKC	DKU R1	DKU R2	DKU R3
L37 Rear	L27 Rear	L17 Rear	CHIP1	DKU EHV	R17 Rear	R27 Rear
L36 Rear	L26 Rear	L16 Rear	CHIP2		R16 Rear	R26 Rear
DOMAIN 1	DOMAIN 8	DOMAIN 4	CHIP3		DOMAIN 2	DOMAIN 6
L35 Front	L25 Front	L15 Front	CHIP4		R15 Front	R25 Front
KU POWE	KU POWE	KU POWE	BATTERY		KU POWE	KU POWE
DKU FAN	DKU FAN	DKU FAN			DKU FAN	DKU FAN

Detail Configuration & Status

Click on an Array Component to the right to see its detailed configuration data here.

L33 Rear	L23 Rear	L13 Rear	ACP3	ACP1	R13 Rear	R23 Rear	R33 Rear
L32 Rear	L22 Rear	L12 Rear	CACHE		R12 Rear	R22 Rear	R32 Rear
L31 Front	DOMAIN 7	DOMAIN 3	IARED ME		DOMAIN 1	DOMAIN 5	DOMAIN 9
L21 Front	L11 Front	L11 Front	DKC FAN		R11 Front	R21 Front	R31 Front
KU POWE	KU POWE	KU POWE	DKC EHV		KU POWE	KU POWE	KU POWE
DKU FAN	DKU FAN	DKU FAN	S-HSN		DKU FAN	DKU FAN	DKU FAN

Last successful XP data collection at:

Color Legend : No Device Present OK Problem Serious Problem

access management

allocator

any-any device access mapping:

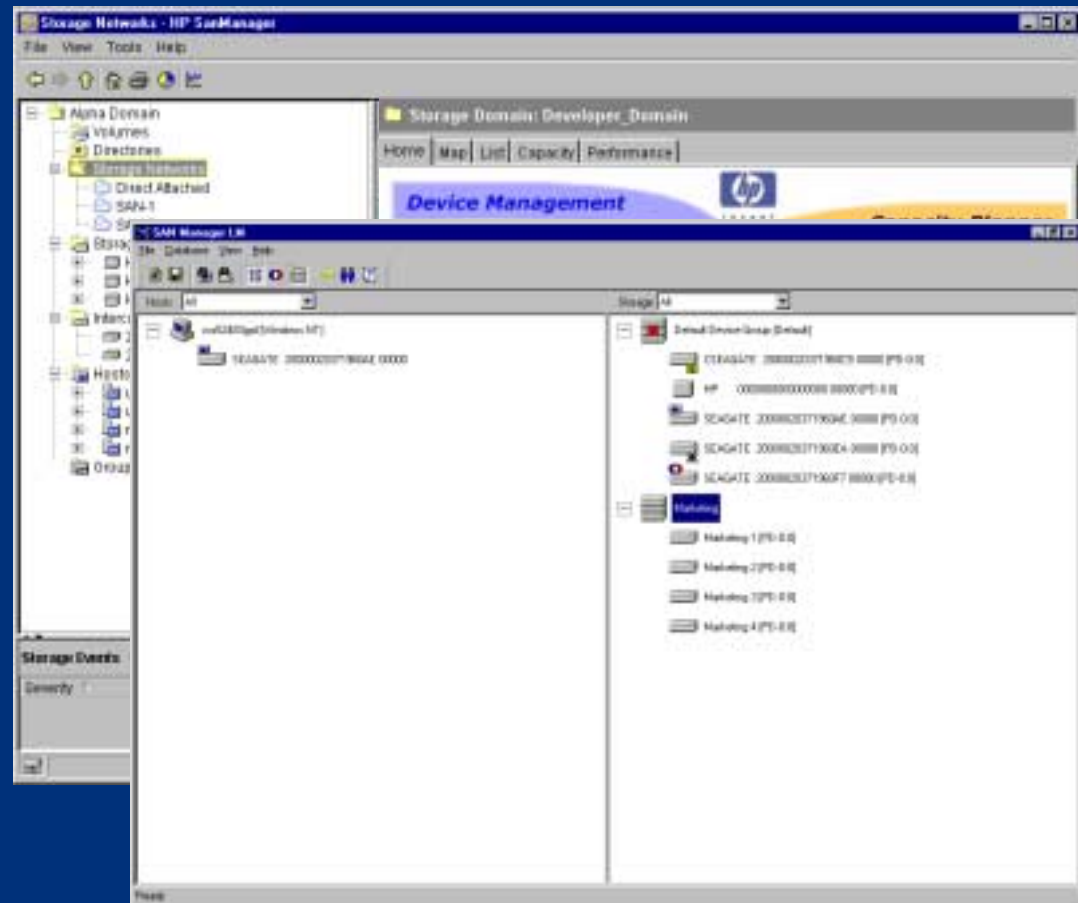
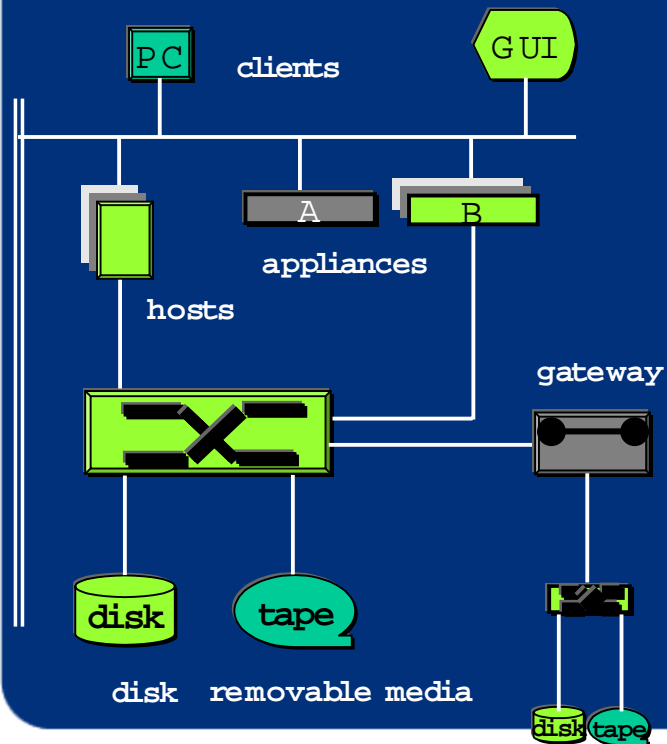
- boot-free drag and assign storage
- visible to volume manager and file system
- fabric & device independent

GUI

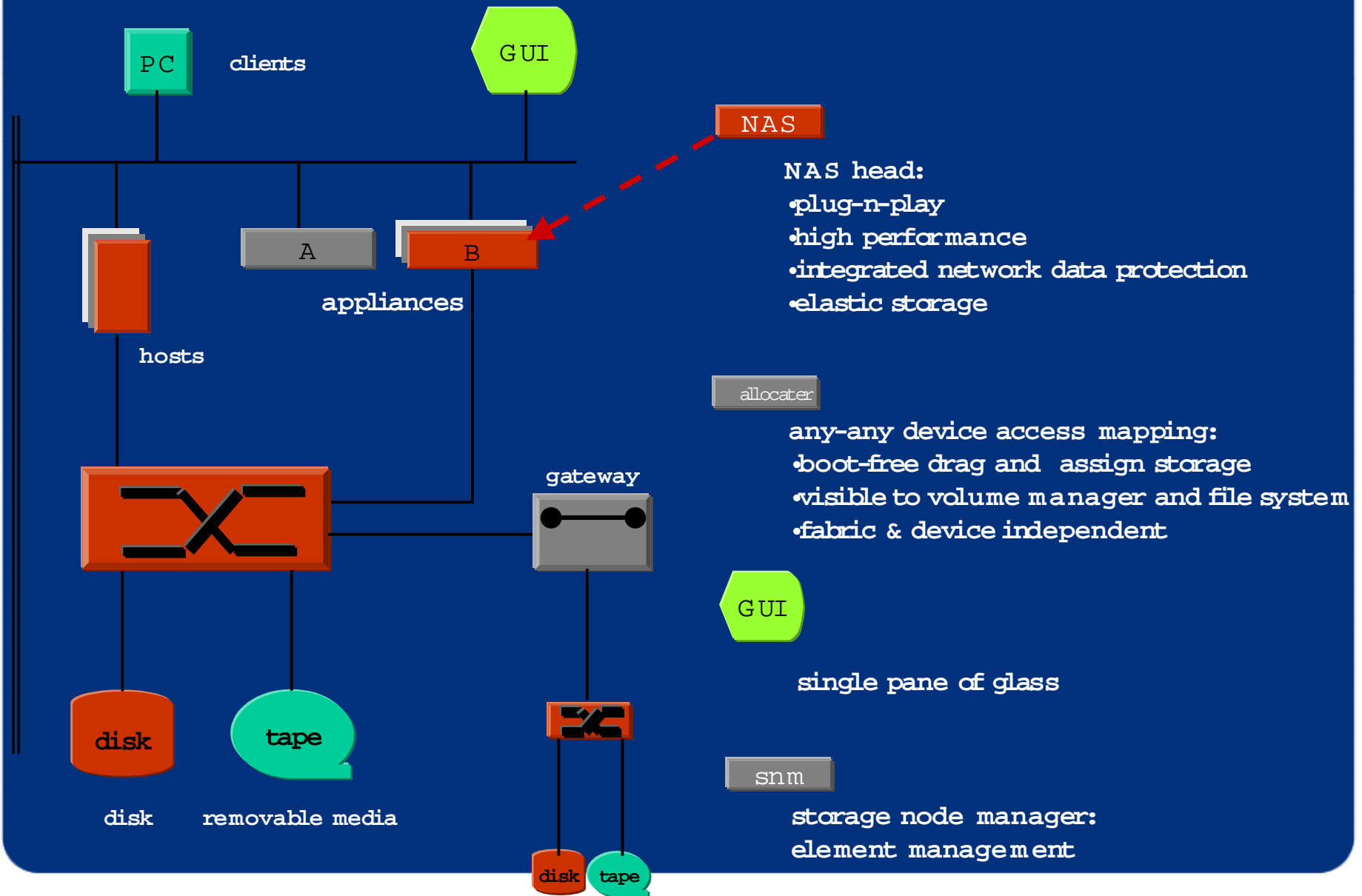
single pane of glass

snm

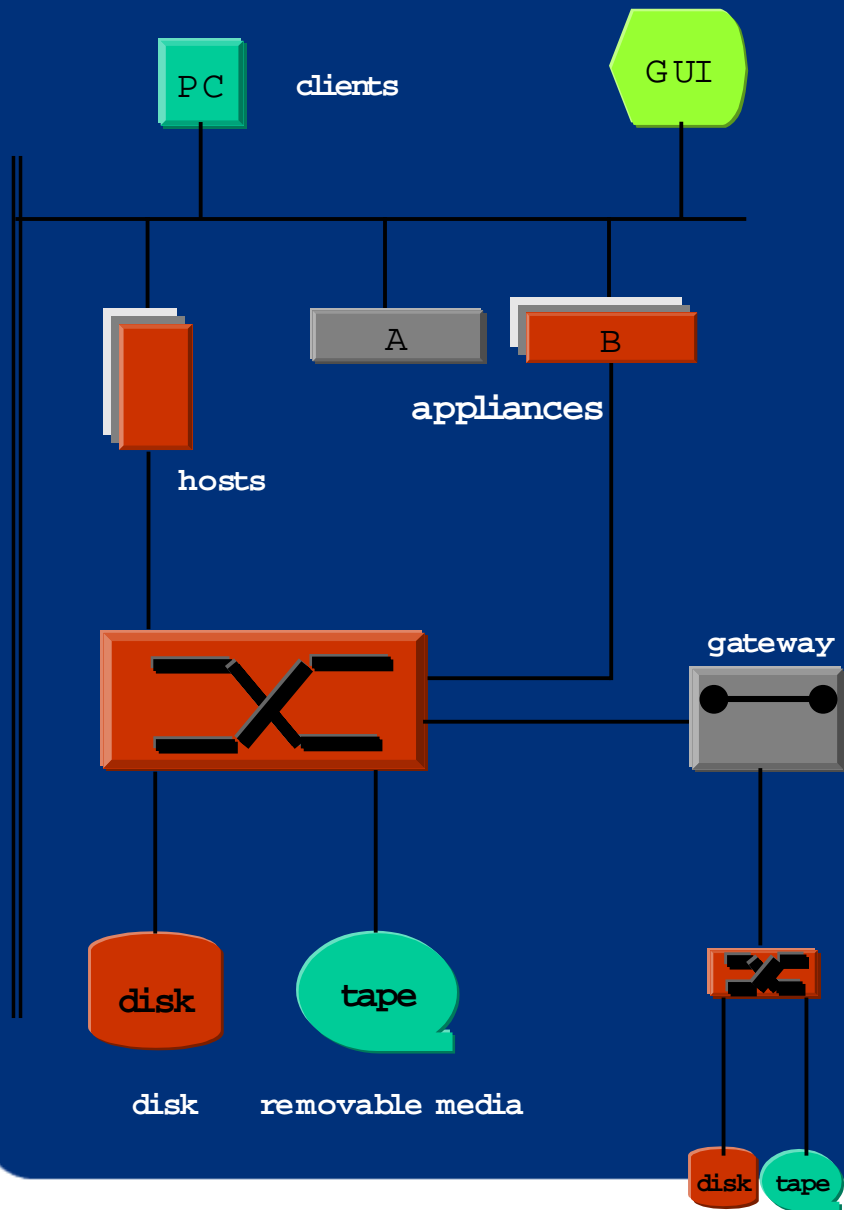
storage node manager:
element management



special data appliance: nas



data management



NDMA

network data management appliance:

- plug-n-play
- manage source -destination moves & copies
- manage xcopy
- manage removable devices
- replication management



server, desktop & mobile clients

- file system agents

allocator

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

sr m : optimizing and building storage

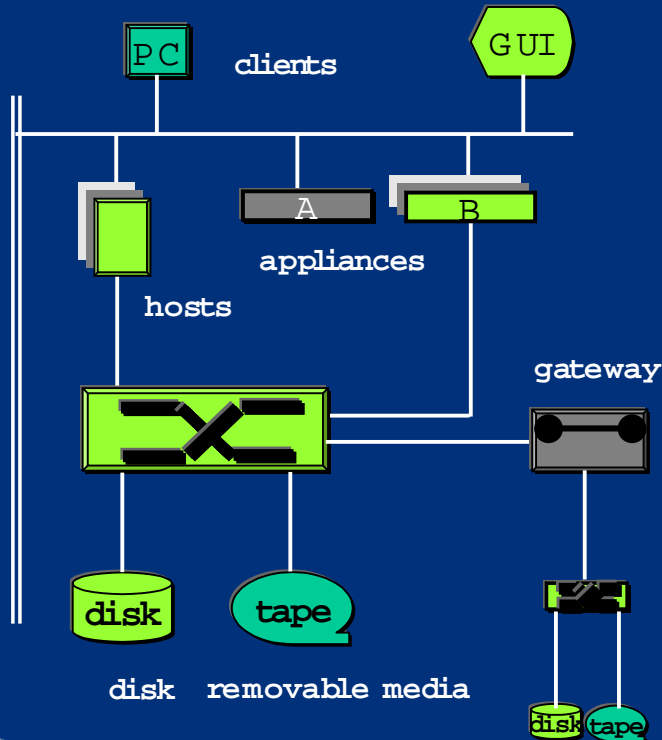
snm

- 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



The screenshot shows the HP OpenView storage area manager interface. The top window displays a file system view with columns for Bytes, Group, Total, Used, Free, Spec, Files, and % Util. The bottom window shows a performance graph titled 'Frames Transmitted/Received' with a red line graph showing data over time from Wednesday 06:00 to Thursday 06:00. Below the graph is a table with the following data:

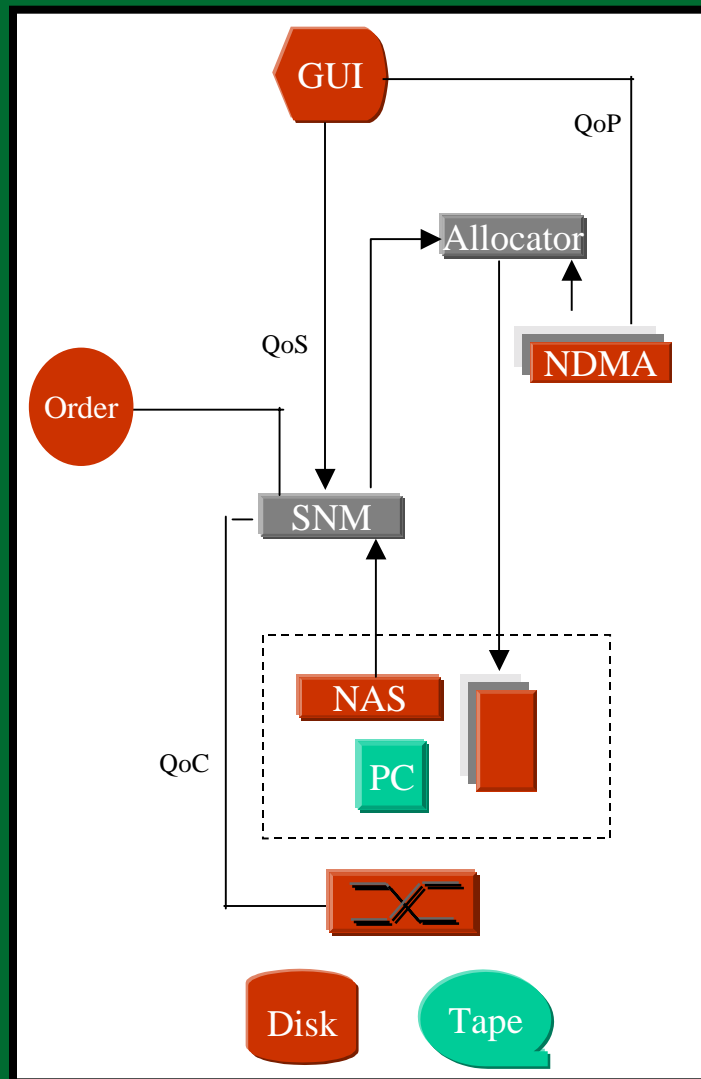
Metric Name	Line Style	Device Name	Device Type	Scale Multiplier
DeviceReceivedFrames ()	—●—	zapdos.rose.hp.com	InterconnectDevice	1.0
DeviceTransmittedFrames...	—■—	zapdos.rose.hp.com	InterconnectDevice	1.0

automated storage provisioning

Allocate/de-allocate storage

- Provision Data Management resources and connections

Monitor storage usage & capacity



Set policy & watermarks

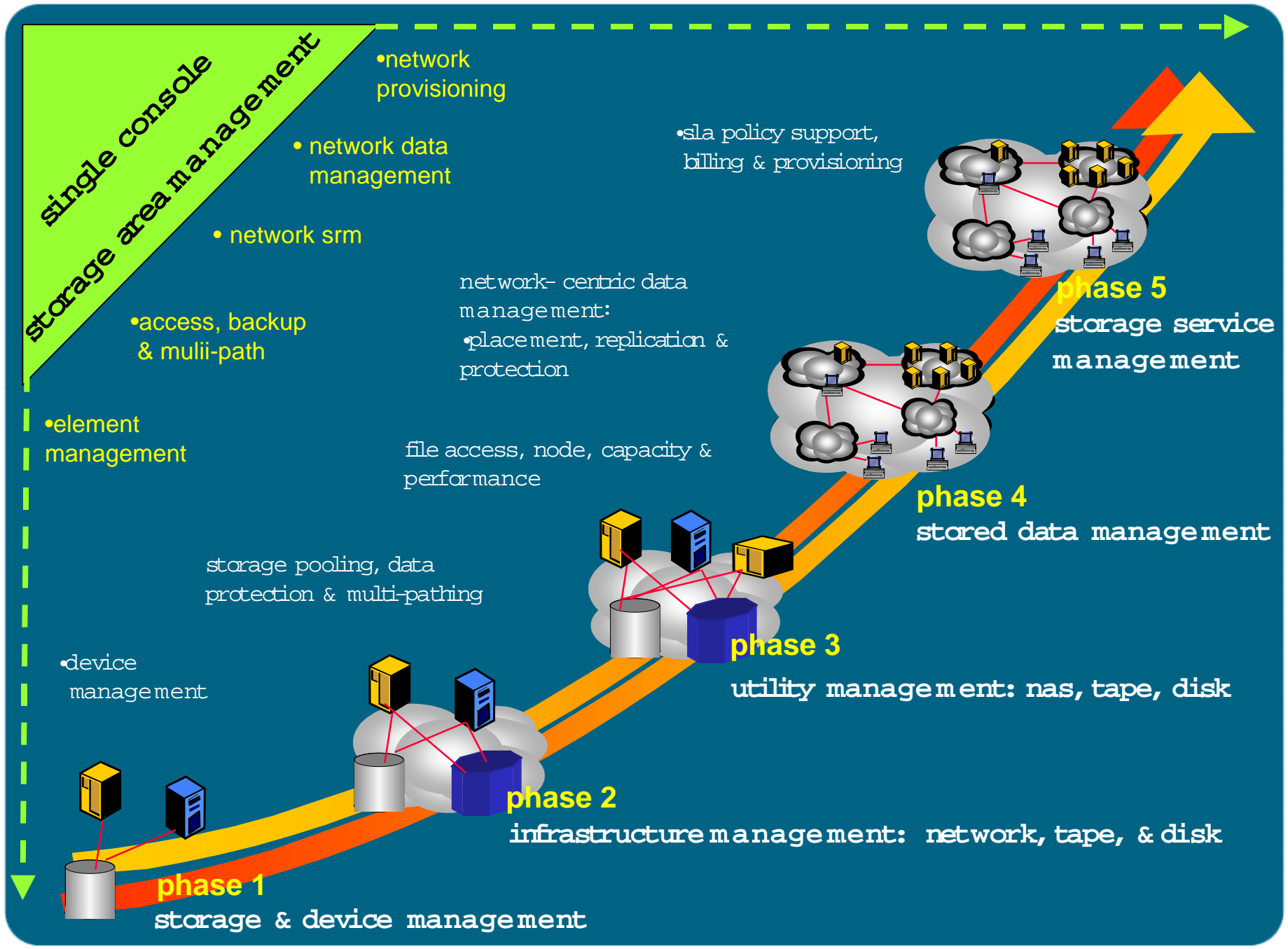
- QoC: Quality of Connection
- QoS: Quality of Service
- QoP: Quality of Protection

- Manage data changes

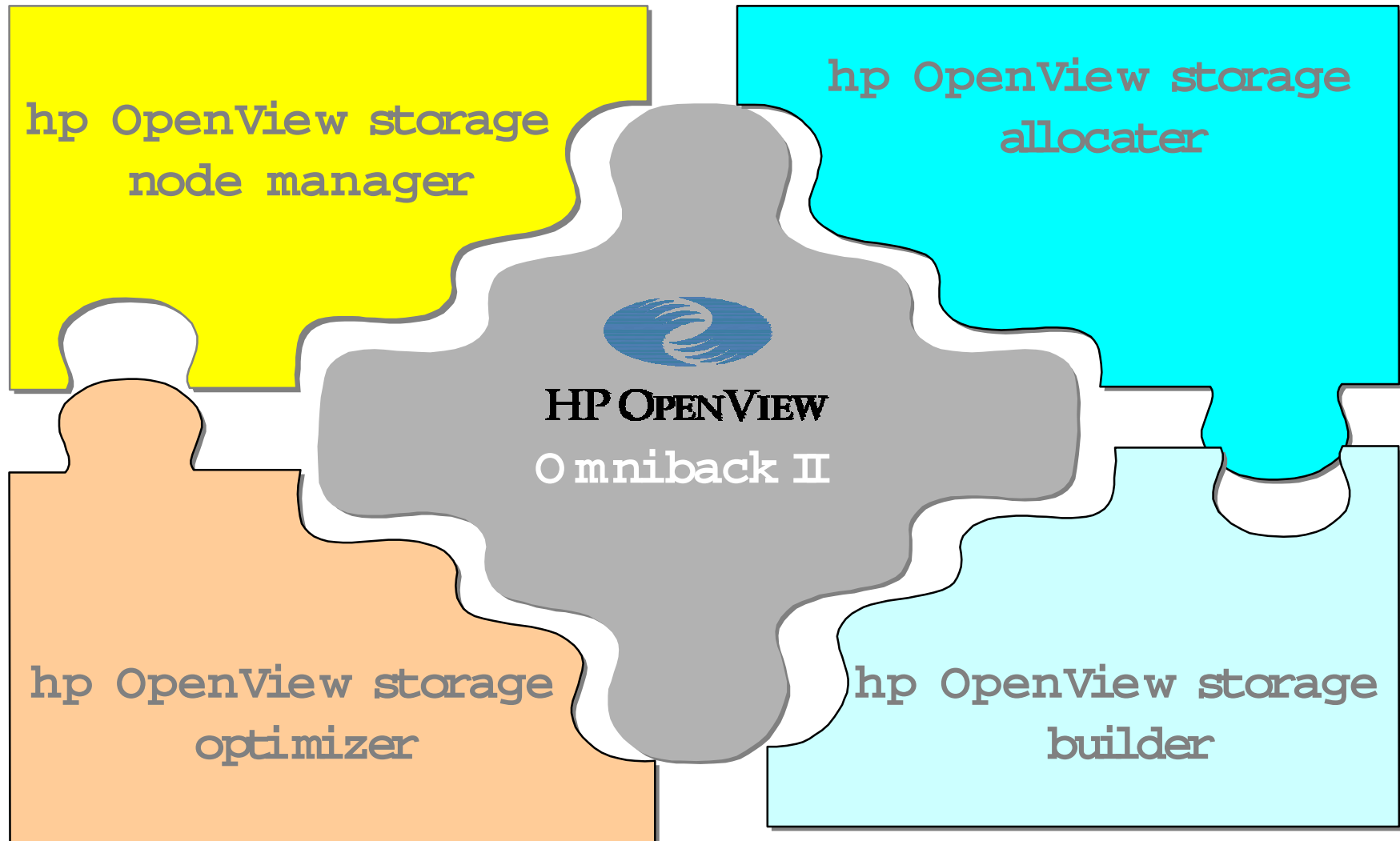
Applications use storage

storage area management software functionality





available today - SAM





i n v e n t