IBM SmartCloud Virtual Storage Center

aka IBM Storage Hypervisor

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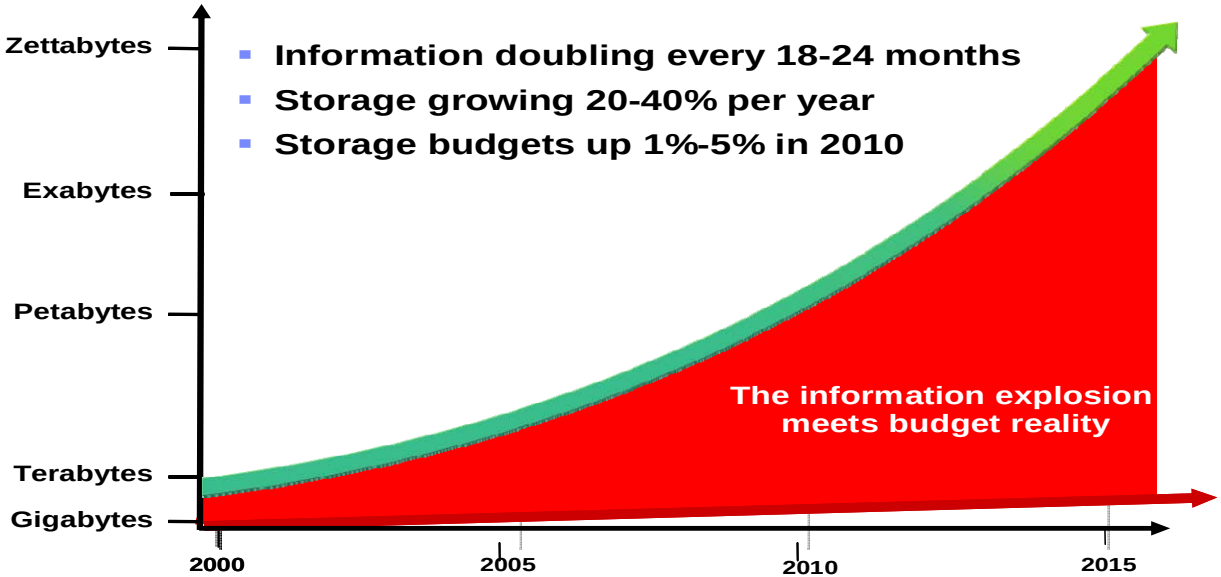
Pulse2012

Meet the Experts. Optimise your infrastructure.

May 31 – June1

Sheraton on the Park Hotel, Sydney

You have faced the problem…



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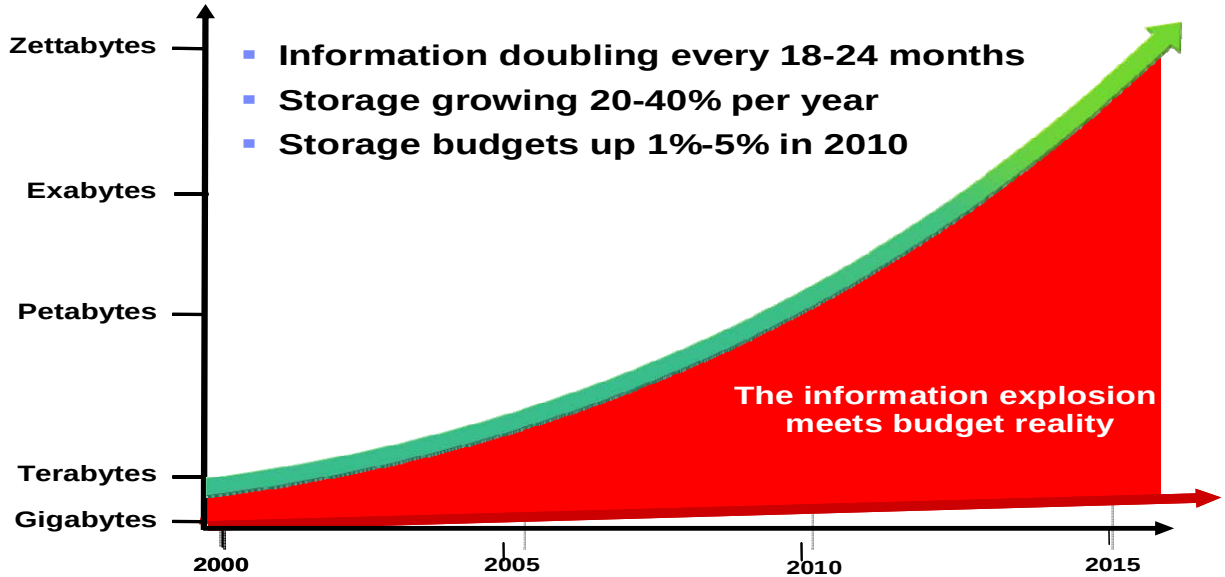

…and heard the "Cloud" buzz

- "…major economies of scale and greater control of growing data volumes."

Cloud is changing how we think about Private IT

- Clients want to use Cloud concepts to improve Private IT
  "Cloud Enable" their environment (Private Storage Cloud)

- What distinguishes a Private Storage Cloud from Traditional IT?

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     (as opposed to physical array-boundary limitations)
  2. **Storage services are standardized** – selected from a storage service catalog.
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What's a Storage hypervisor?

- Server hypervisor has a well understood value connotation
  - Pooled physical resources are consumed by virtual machines resulting in high asset utilization
  - Virtual machines are mobile giving CIO's their choice of physical server device
  - A common set of value capabilities and centralized management are provided for virtual machines regardless of what physical server they are sitting on
  - …cost savings and flexibility!

On Intel systems
server virtualization platform (VMware vSphere or Red Hat EV) and
server virtualization management (VMWare vCenter or Red Hat EV Manager)
On Power systems
server virtualization platform (IBM PowerVM) and
server virtualization management (IBM Director VMControl)

- Storage hypervisor is a rapidly emerging way of describing the same value points in a storage context

Pooled Physical Resources

- Dramatically improve utilization **of your physical storage assets**

- How? Pooled physical resources **from virtually any disk array vendor or tier**

DELL HITACHI IBM NetApp EMC² Sun hp
NEC BULL FUJITSU pillar DATA SYSTEMS tms NEXSAN xio

Common Capabilities

- Deliver tier-1 service **regardless of hardware choice**
- How? Common capabilities **delivered by the storage hypervisor**
  - I/O caching, thin provisioning, automated tiering, application-integrated snapshot and mirroring, mobility-driven disruption avoidance

SLA (Service Level Agreement) is encapsulated with the data in a virtual volume.

The desired service is delivered by the Storage hypervisor independent of the underlying hardware platform.

Mobility

- Balance workload, manage lease termination, improve datacenter performance

- How? Mobility **of virtual volumes between any physical disk arrays**
  - Move on the fly, snapshot or mirror between arrays…
  - …In a single physical datacenter or across two physical datacenters up to 300km apart

Centralised Management

- Optimize your people **for the challenges of day-to-day operations**

- How? Centralised management
  - Visualization, health, capacity, performance
  - Storage services catalog, automated provisioning, pay-per-use

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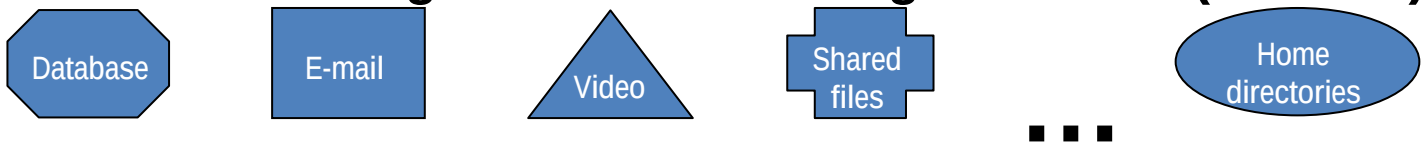
Cloud Enable Traditional IT

Storage services are standardized

1. Create the catalog of available storage services (15 to 20)



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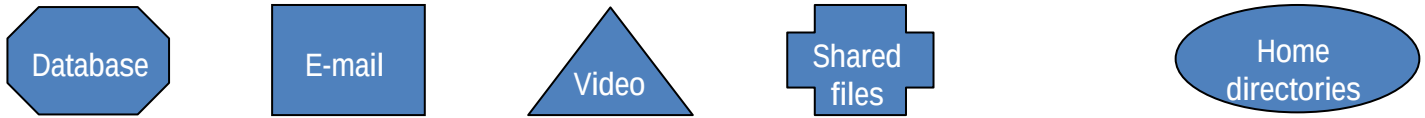
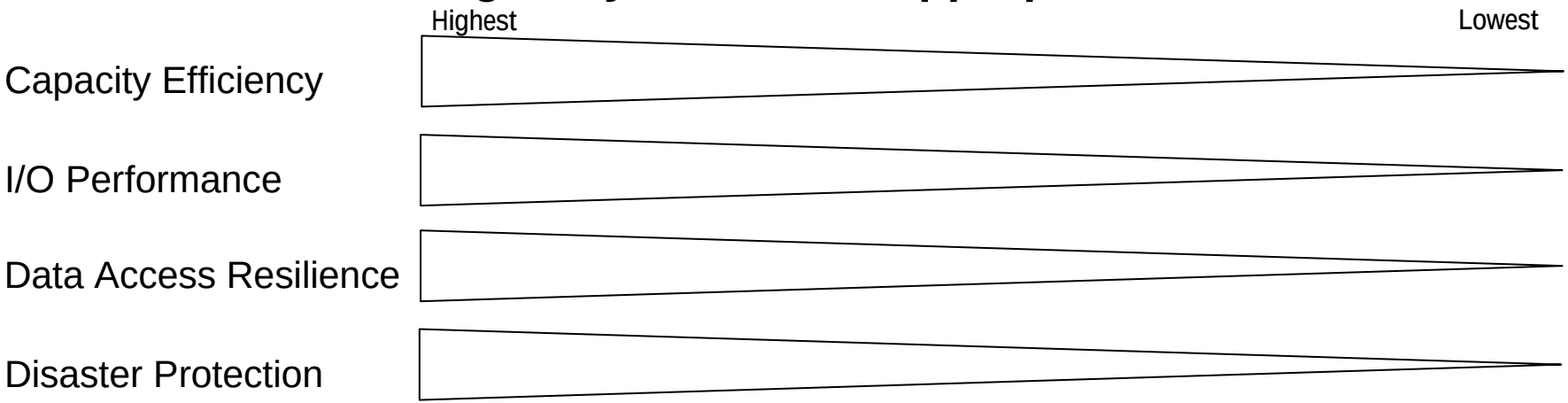


2. For each catalog entry, define the appropriate service levels



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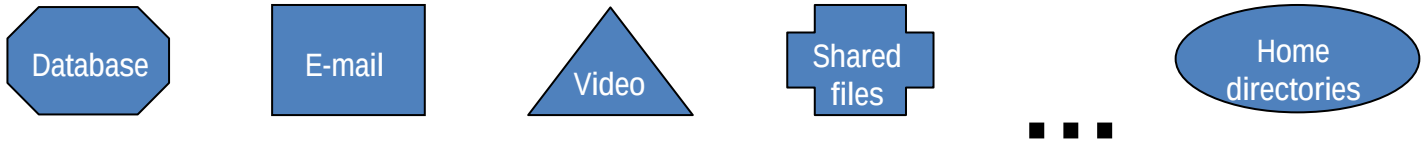

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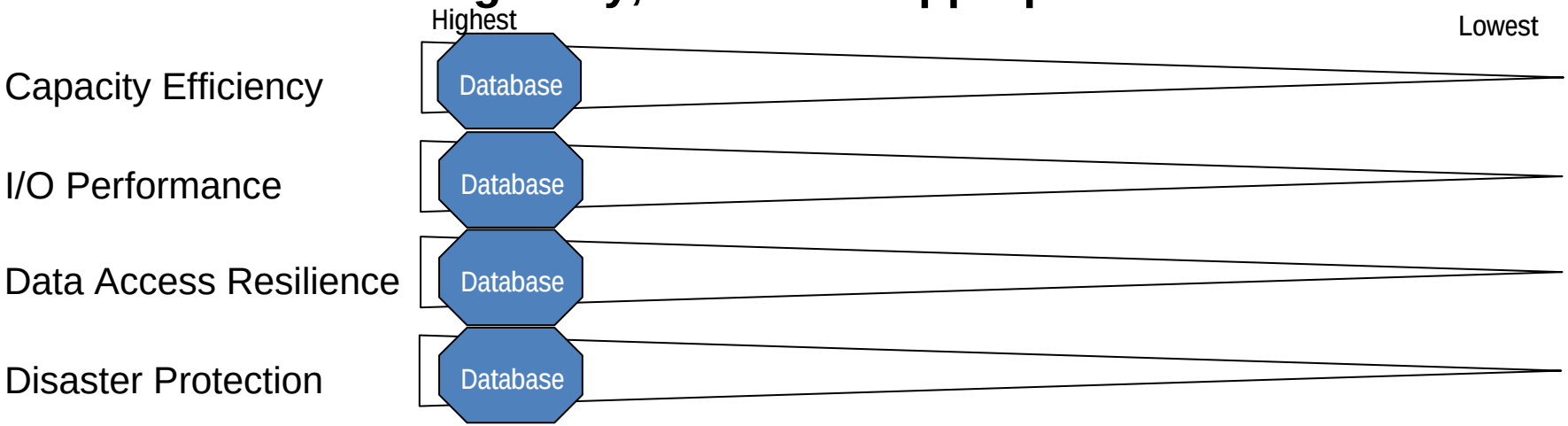

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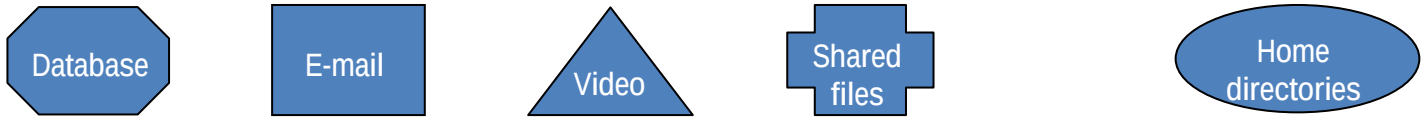

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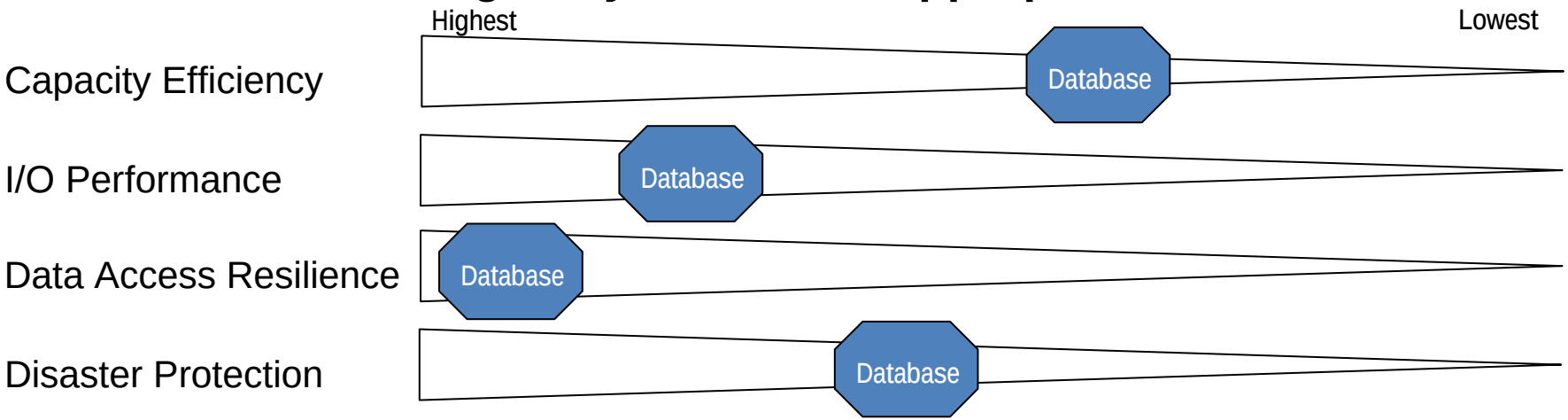
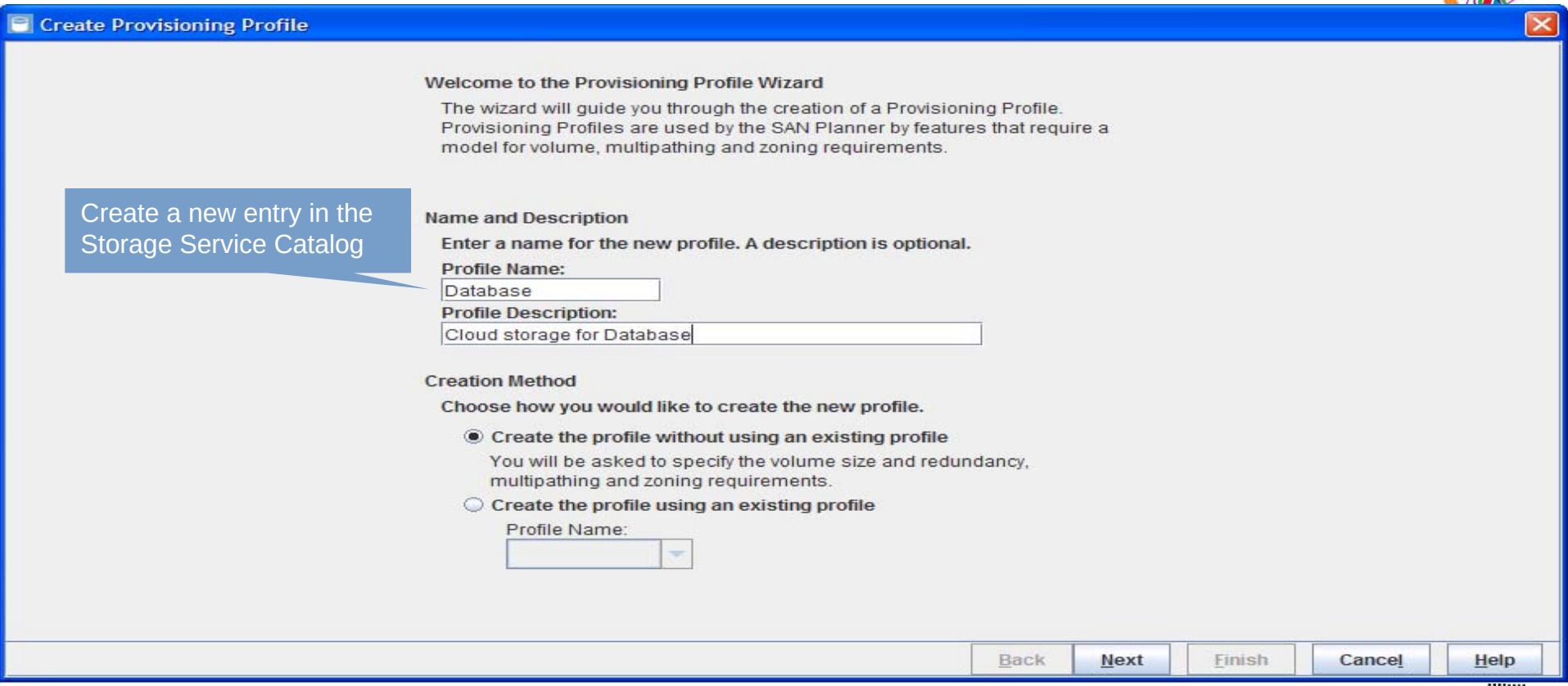
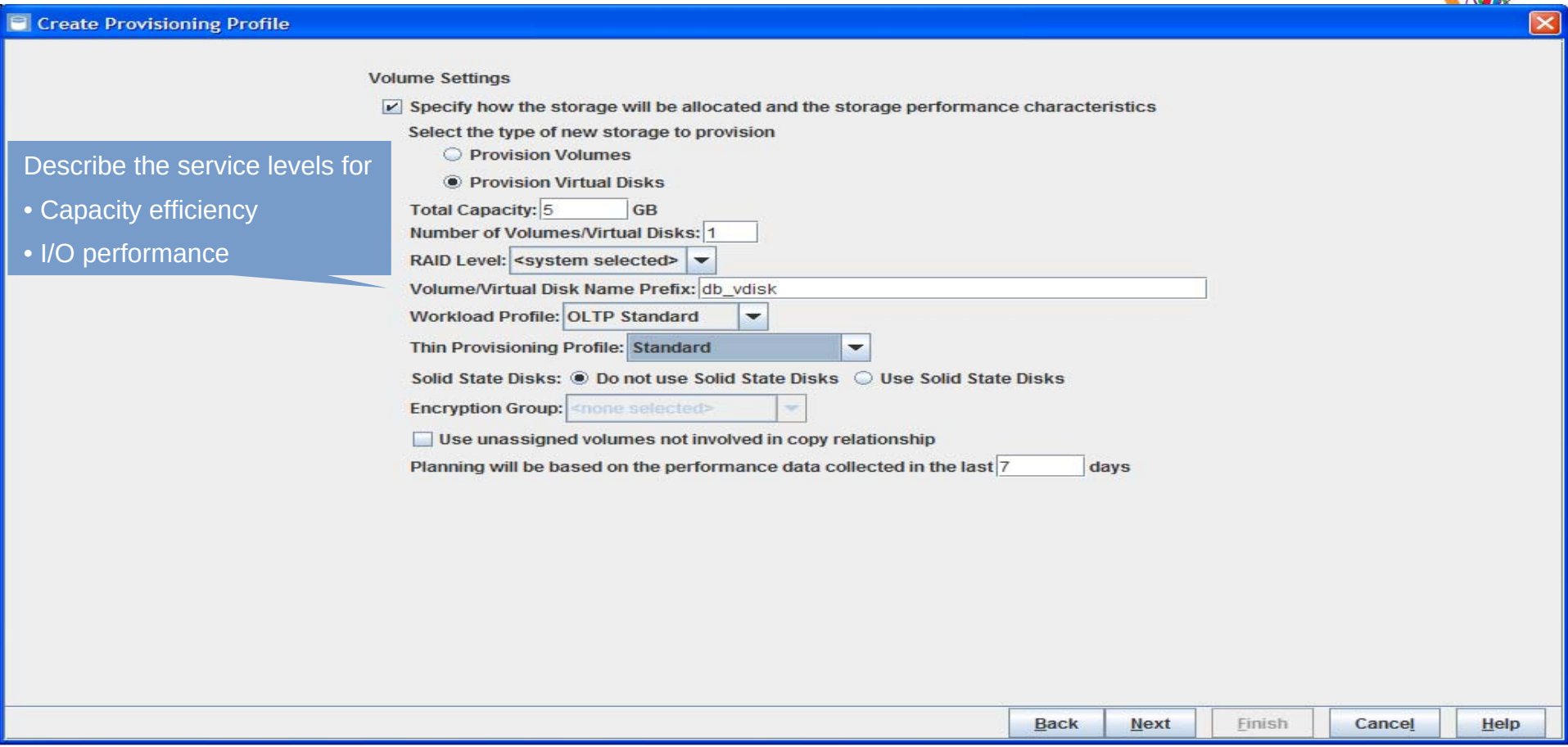
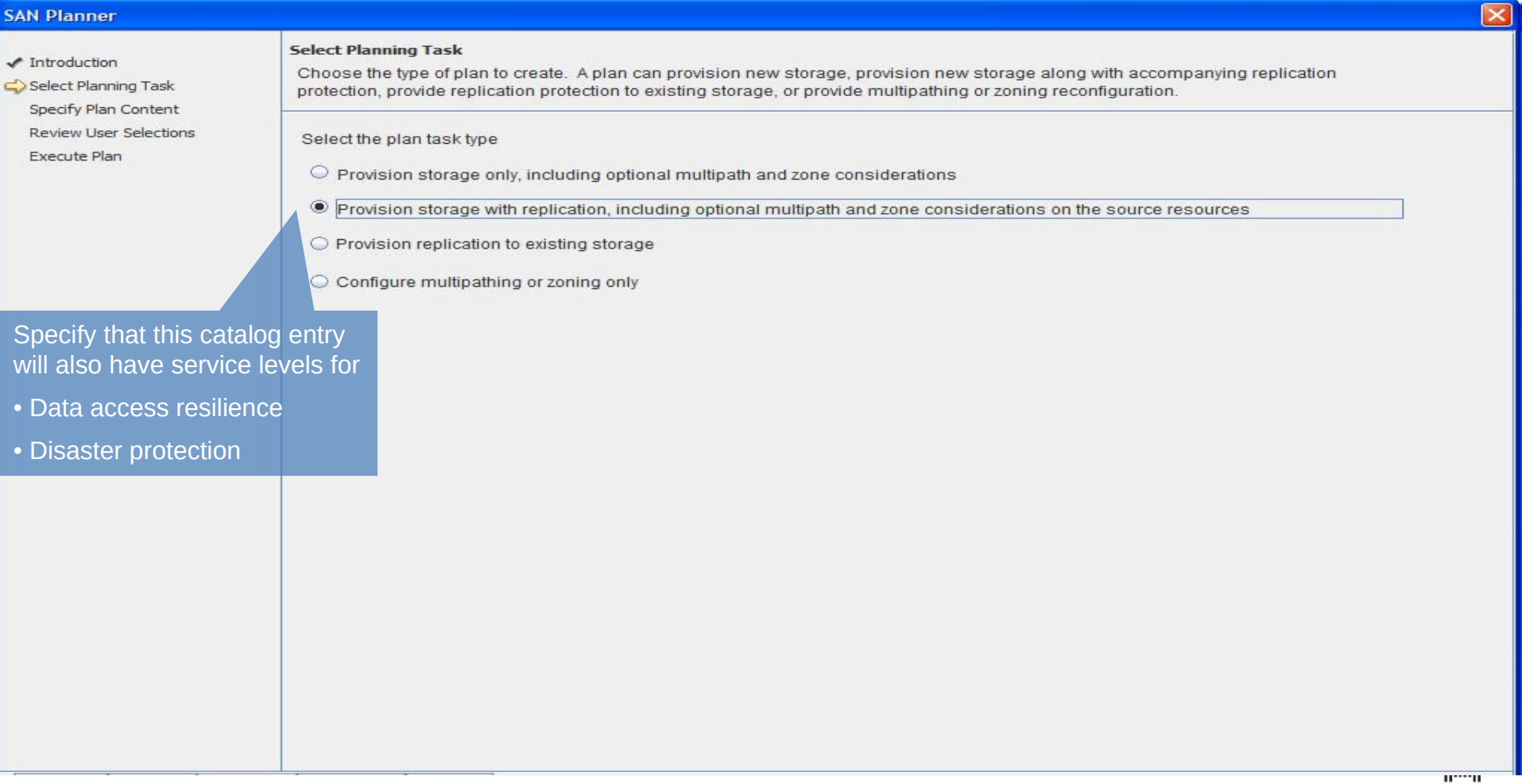


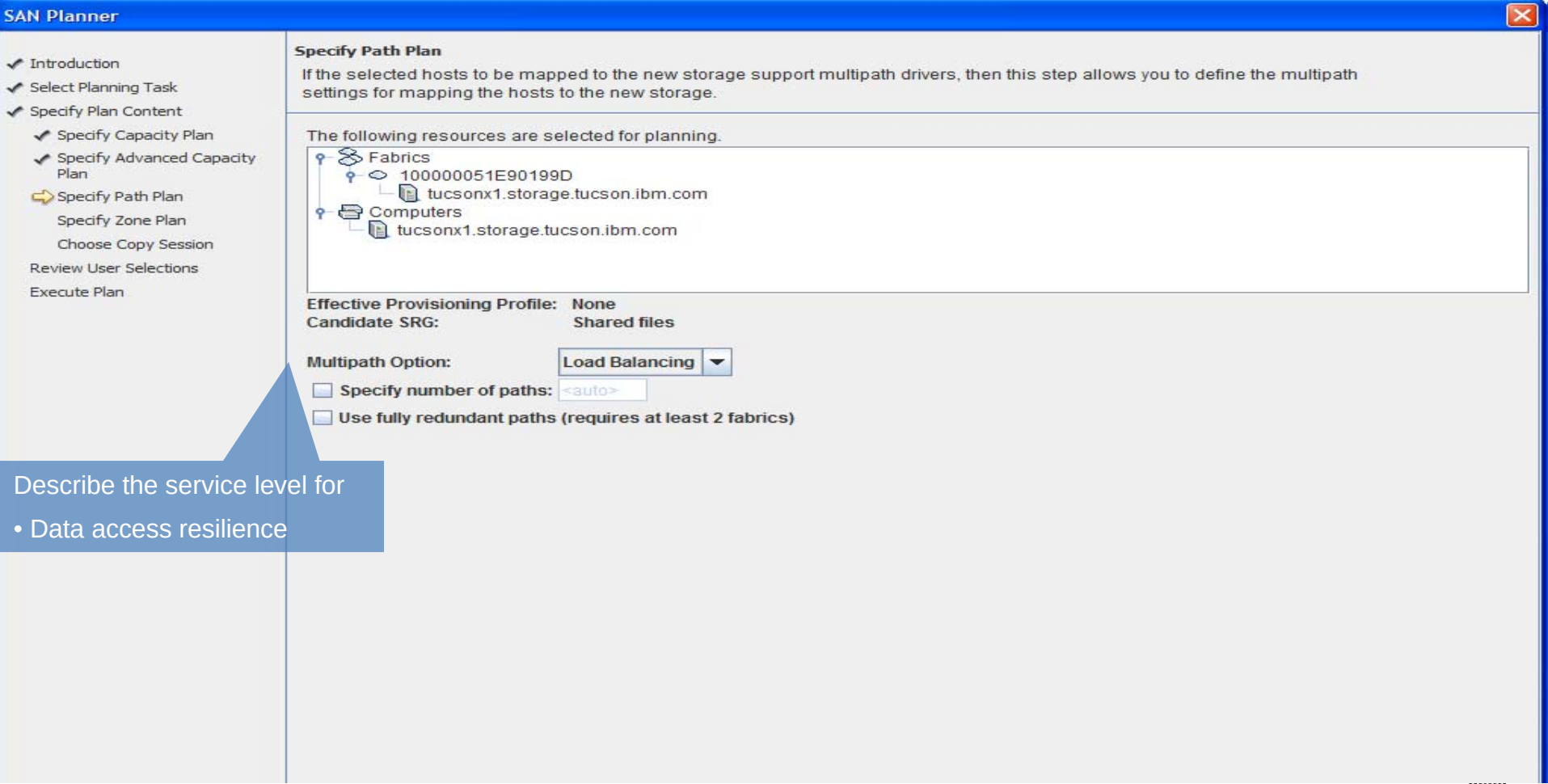

Create Provisioning Profile
Welcome to the Provisioning Profile Wizard
The wizard will guide you through the creation of a Provisioning Profile. Provisioning Profiles are used by the SAN Planner by features that require a model for volume, multipathing and zoning requirements.
Create a new entry in the Storage Service Catalog
Name and Description
Enter a name for the new profile. A description is optional.
Profile Name:
Database
Profile Description:
Cloud storage for Database
Creation Method
Choose how you would like to create the new profile.
Create the profile without using an existing profile
You will be asked to specify the volume size and redundancy, multipathing and zoning requirements.
Create the profile using an existing profile
Profile Name:
Back
Next
Finish
Cancel
Help



Describe the service levels for

- Capacity efficiency
- I/O performance


SAN Planner
Introduction
Select Planning Task
Specify Plan Content
Review User Selections
Execute Plan
Select Planning Task
Choose the type of plan to create. A plan can provision new storage, provision new storage along with accompanying replication protection, provide replication protection to existing storage, or provide multipathing or zoning reconfiguration.
Select the plan task type
Provision storage only, including optional multipath and zone considerations
Provision storage with replication, including optional multipath and zone considerations on the source resources
Provision replication to existing storage
Configure multipathing or zoning only
Specify that this catalog entry will also have service levels for
• Data access resilience
• Disaster protection


SAN Planner
Introduction
Select Planning Task
Specify Plan Content
Specify Capacity Plan
Specify Advanced Capacity Plan
Specify Path Plan
Specify Zone Plan
Choose Copy Session
Review User Selections
Execute Plan
Specify Path Plan
If the selected hosts to be mapped to the new storage support multipath drivers, then this step allows you to define the multipath settings for mapping the hosts to the new storage.
The following resources are selected for planning.
Fabrics
100000051E90199D
tucsonx1.storage.tucson.ibm.com
Computers
tucsonx1.storage.tucson.ibm.com
Effective Provisioning Profile: None
Candidate SRG: Shared files
Multipath Option: Load Balancing
Specify number of paths: <auto>
Use fully redundant paths (requires at least 2 fabrics)
Describe the service level for
• Data access resilience

SAN Planner

- Introduction
- Select Planning Task
- Specify Plan Content
  - Specify Capacity Plan
  - Specify Advanced Capacity Plan
  - Specify Path Plan
  - Specify Zone Plan
  - Choose Copy Session
  - Specify Session Properties
- Review User Selections
- Execute Plan

Specify Session Properties

Provide a name for the replication session and choose a session type. The list of session types can be filtered to simplify choosing the session type.

Session Name: Shared Files Session

Choose a session type from the list below

Filter by Copy Technology: No filtering

Location: Same Region

Use practice volume

- FlashCopy
- Virtual Disk Mirroring
- Metro Mirror Failover/Failback
- Metro Mirror Failover/Failback with Practice
- Metro Mirror Single Direction
- Global Mirror Failover/Failback
- Global Mirror Failover/Failback with Practice
- Global Mirror Single Direction

Copy Synchronization Rate: 50 %

Describe the service level for

- Disaster protection

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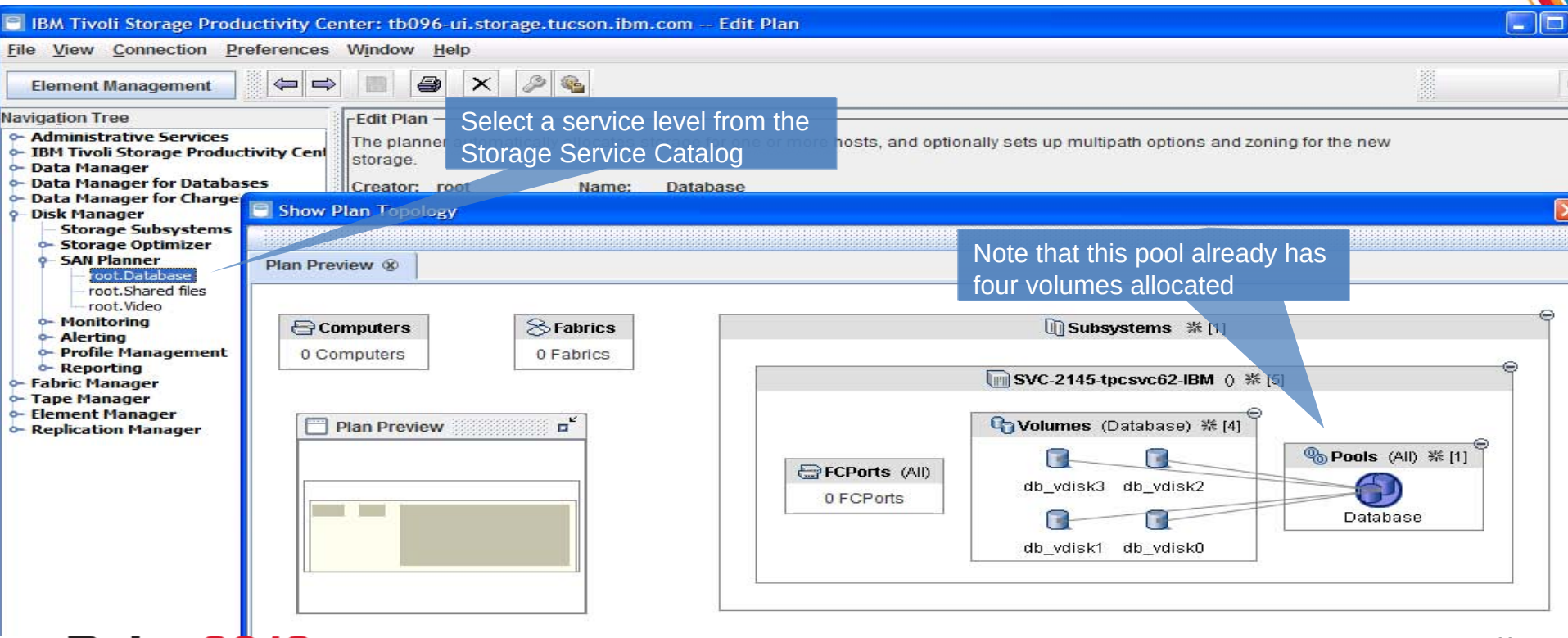
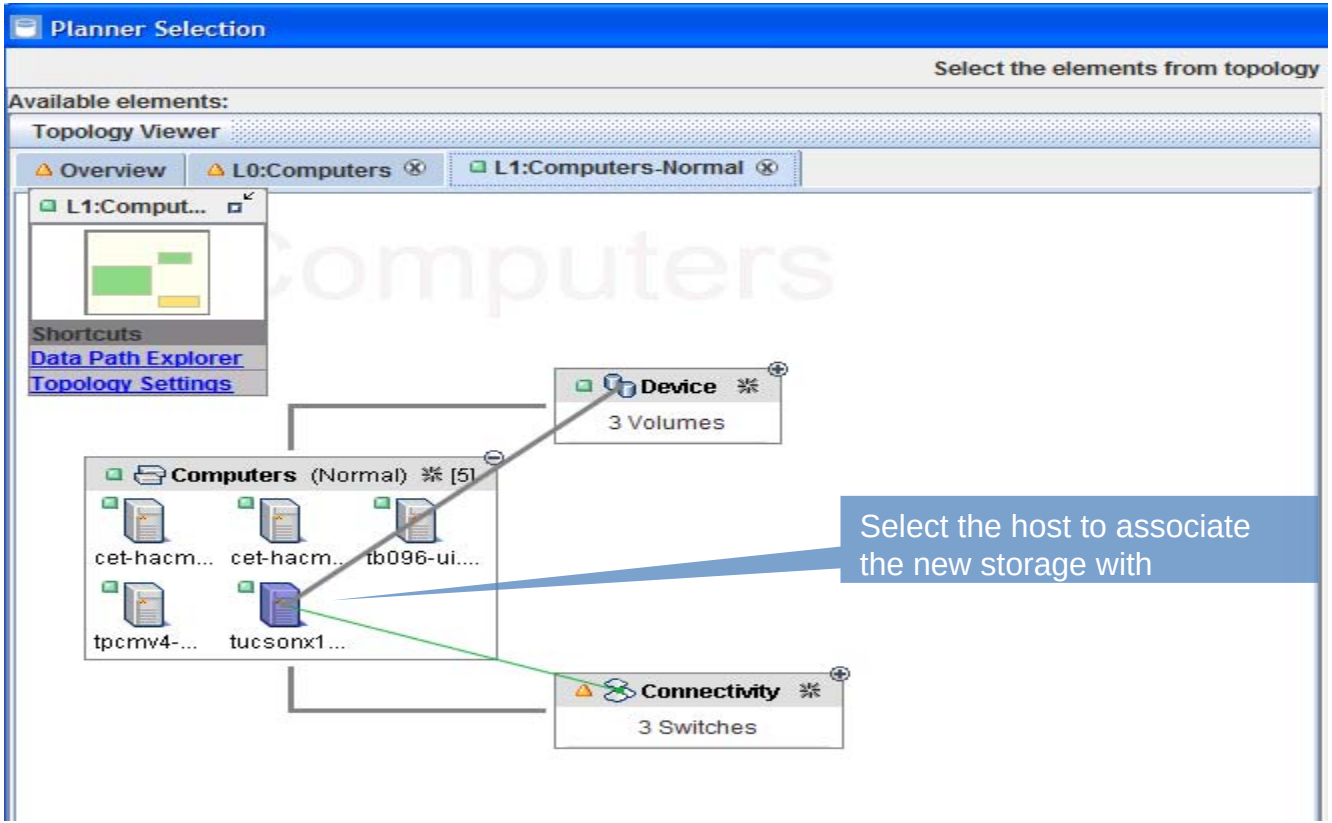
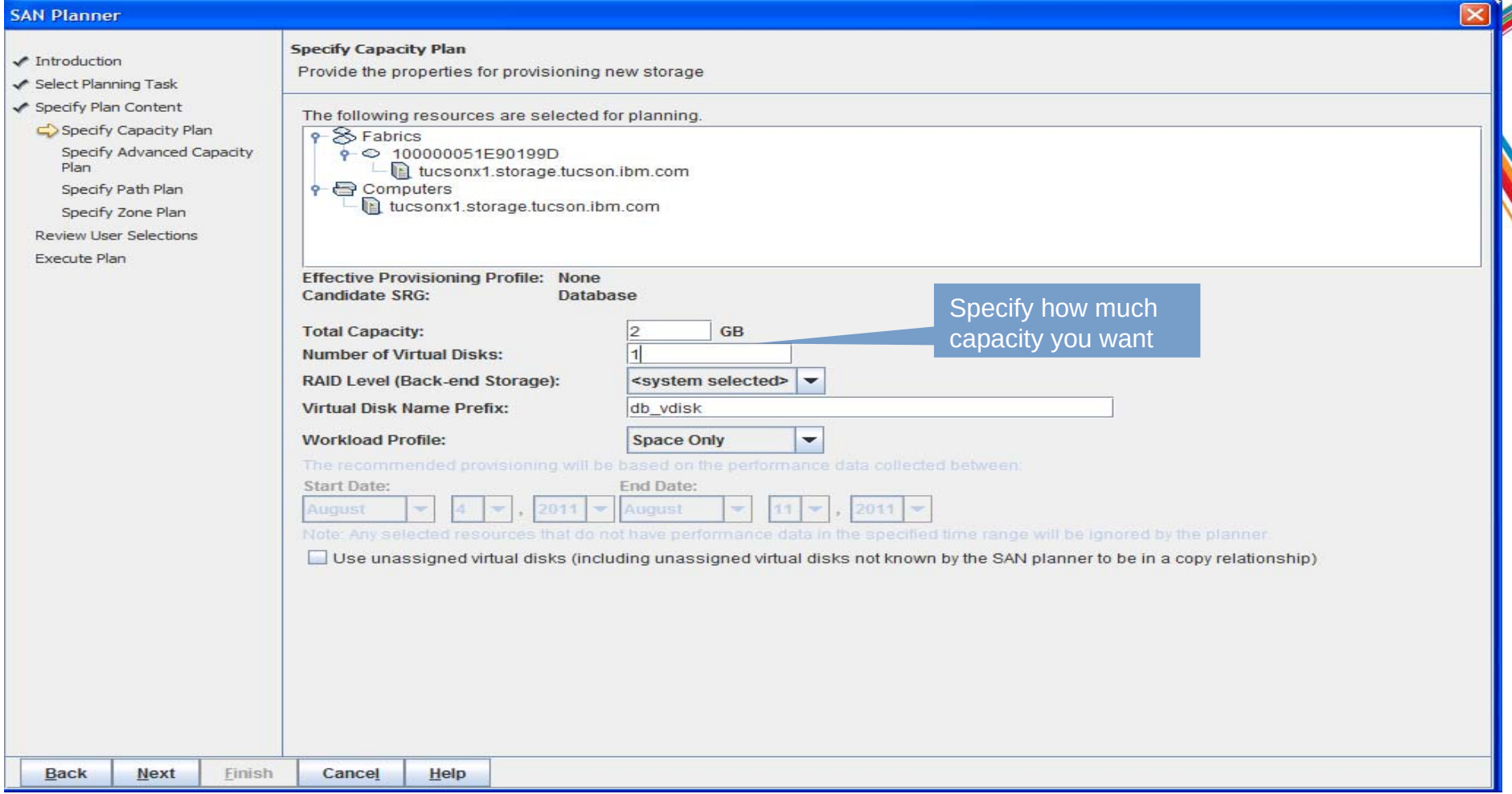
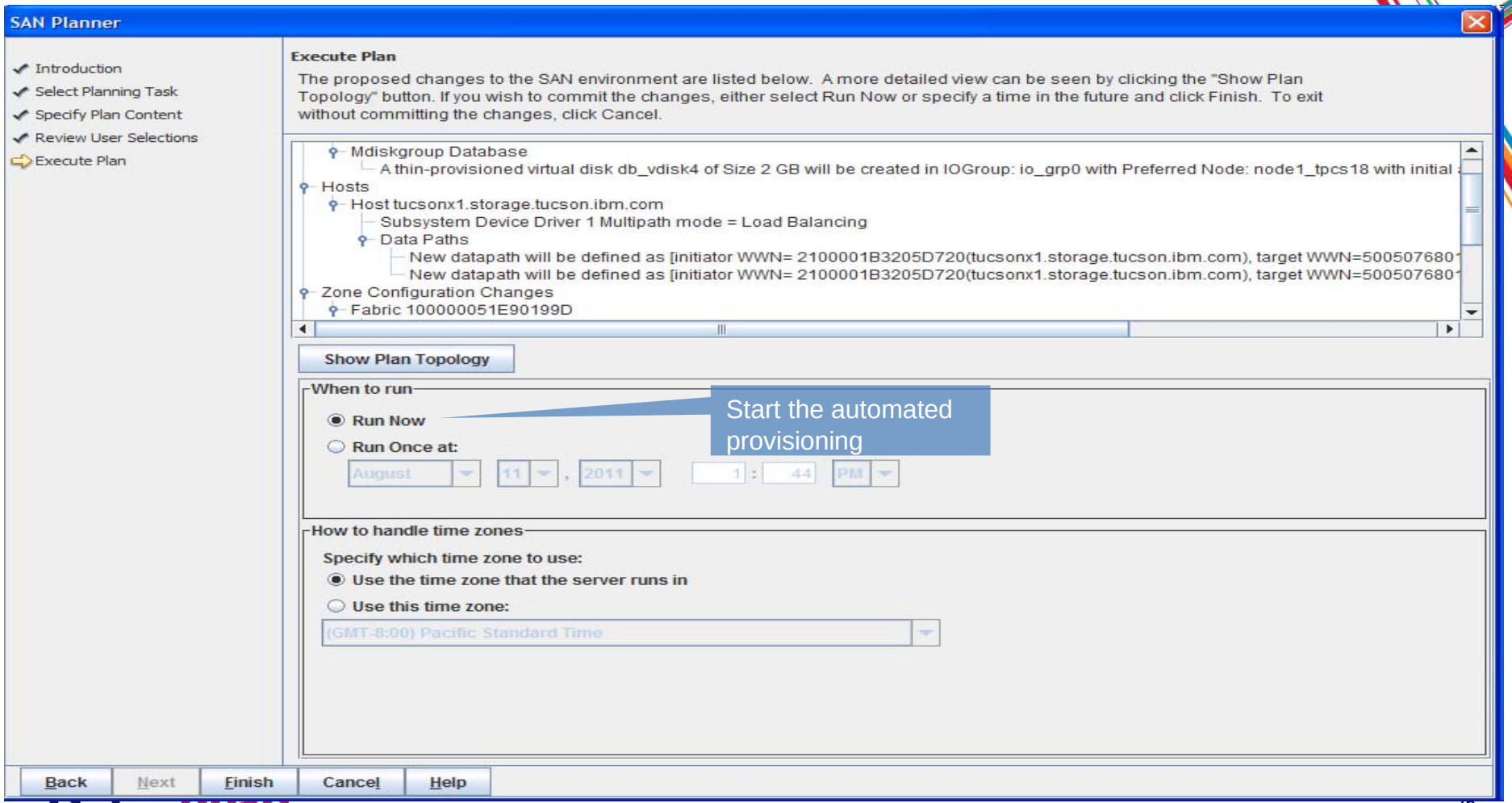
Storage provisioning is self service




Planner Selection
Select the elements from topology
Available elements:
Topology Viewer
Overview
L0:Computers
L1:Computers-Normal
L1:Comput...
Shortcuts
Data Path Explorer
Topology Settings
Device
3 Volumes
Computers (Normal) [5]
cet-hacm...
cet-hacm...
tb096-ui....
tpcmv4-...
tucsonx1...
Connectivity
3 Switches
Select the host to associate the new storage with



Specify how much capacity you want


SAN Planner
Introduction
Select Planning Task
Specify Plan Content
Review User Selections
Execute Plan
Execute Plan
The proposed changes to the SAN environment are listed below. A more detailed view can be seen by clicking the "Show Plan Topology" button. If you wish to commit the changes, either select Run Now or specify a time in the future and click Finish. To exit without committing the changes, click Cancel.
Mdiskgroup Database
A thin-provisioned virtual disk db_vdisk4 of Size 2 GB will be created in IOGroup: io_grp0 with Preferred Node: node1_tpcs18 with initial
Hosts
Host tucsonx1.storage.tucson.ibm.com
Subsystem Device Driver 1 Multipath mode = Load Balancing
Data Paths
New datapath will be defined as [initiator WWN= 2100001B3205D720(tucsonx1.storage.tucson.ibm.com), target WWN=500507680
New datapath will be defined as [initiator WWN= 2100001B3205D720(tucsonx1.storage.tucson.ibm.com), target WWN=500507680
Zone Configuration Changes
Fabric 100000051E90199D
Show Plan Topology
When to run
Run Now
Run Once at:
August
11
2011
1
44
PM
Start the automated provisioning
How to handle time zones
Specify which time zone to use:
Use the time zone that the server runs in
Use this time zone:
(GMT-8:00) Pacific Standard Time
Back
Next
Finish
Cancel
Help

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Tivoli. software

Invoice by Account Level

Invoice Number 1

Date Range	Current Week		
Start Date	August 7, 2011	**End Date**	August 13, 2011

The Big Time Company
Corporate Headquarters
3013 Cork Street.
Roseville, CA 95667
United States of America

Charge different rates for each service level

HR - Human Resources

	Units	Rate	Charge
Database			
Disk Space Allocated (GB)	250.00	1.0500	262.50
Disk Space Consumed (GB)	239.00	0.0000	0.00
Total For: Database			**262.50**
Email			
Disk Space Allocated (GB)	100.00	0.0000	0.00
Disk Space Consumed (GB)	97.00	1.4000	135.80
Total For: Email			**135.80**
Total For: HR - Human Resources			**398.30**

Charge based on allocated – or consumed space

Cloud Enable Traditional IT

Summary for block storage

What IBM products enable this Private Storage Cloud?

1. **Storage resources are virtualized**
2. **Storage services are standardized**
3. **Storage provisioning is self-service**
4. **Storage usage is paid per use**

IBM Storage hypervisor

- **System Storage SAN Volume Controller**
- **Tivoli Storage Productivity Center**
- **Tivoli Storage FlashCopy Manager**

→ Tivoli Usage and Accounting Manager

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