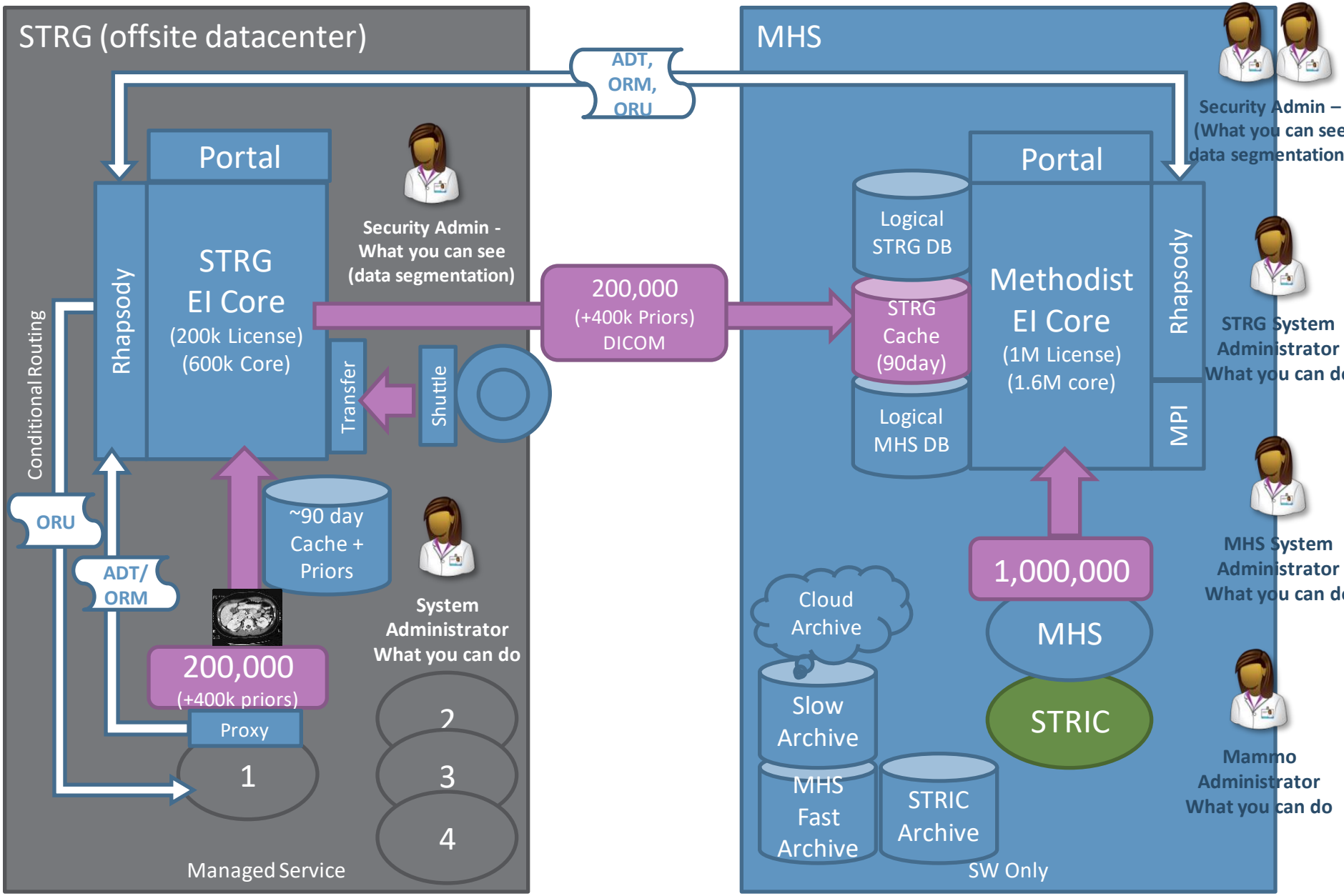
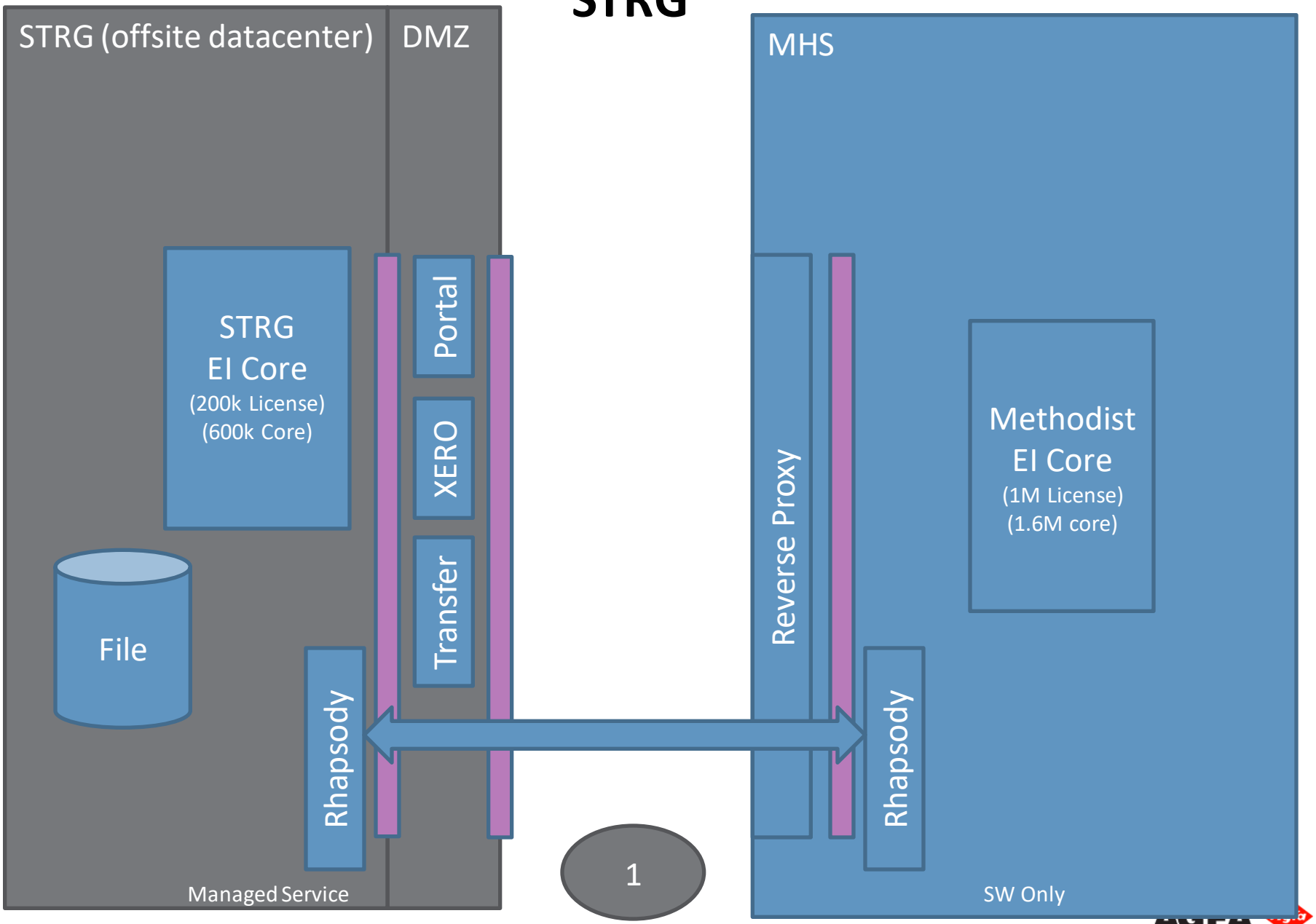

STRG (offsite datacenter)
MHS
ADT, ORM, ORU
Portal
Rhapsody
STRG EI Core
(200k License)
(600k Core)
Security Admin -
What you can see
(data segmentation)
200,000
(+400k Priors)
DICOM
Transfer
Shuttle
Conditional Routing
ORU
ADT/ ORM
~90 day Cache + Priors
System Administrator
What you can do
200,000
(+400k priors)
Proxy
1
2
3
4
Managed Service
Logical STRG DB
STRG Cache (90day)
Logical MHS DB
Portal
Methodist EI Core
(1M License)
(1.6M core)
Rhapsody
MPI
1,000,000
MHS
STRIC
Cloud Archive
Slow Archive
MHS Fast Archive
STRIC Archive
SW Only
Security Admin –
(What you can see
data segmentation
STRG System
Administrator
What you can do
MHS System
Administrator
What you can do
Mammo
Administrator
What you can do

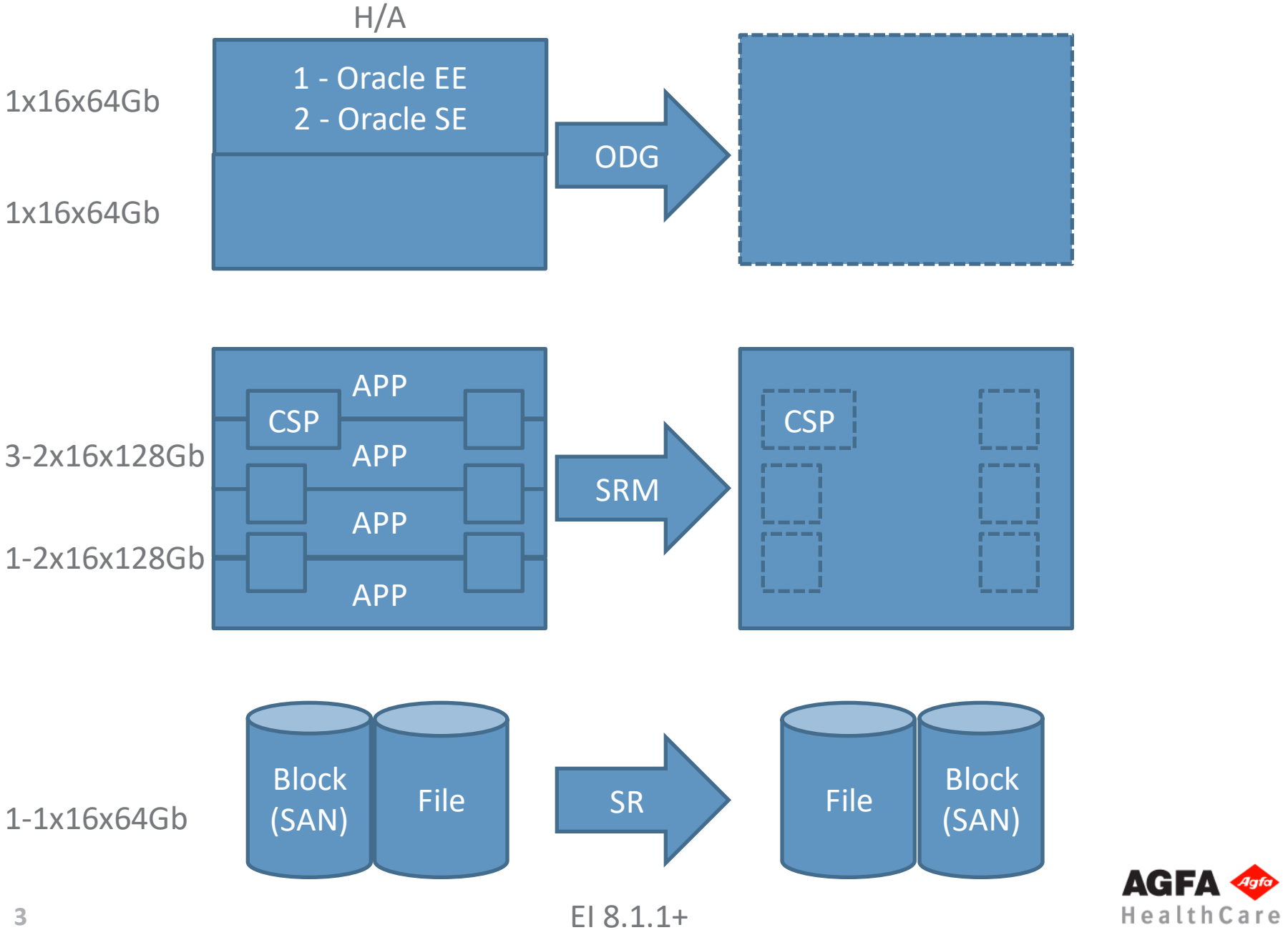
STRG



EI 8.1.1+

AGFA HealthCare

STRG Active-Standby (99.99%)



EI 8.1.1+

AGFA HealthCare

STRG VM Recommendation

DC #1 Active

1. DB Cluster
   - 12 vCPU 84GB RAM vMem
   - Agfa would deploy 2x1x16 64GB RAM servers
   - Provides N+1 configuration and initial fail Over inside DC #1
2. Application Cluster
   - 81vCPU 277GB RAM vMEM
   - Agfa would deploy 4x2x16 128GB RAM servers
   - Provides N+1 configuration
3. Test Cluster
   - 14vCPU 60GB RAM vMEM
   - Agfa would deploy 1x1x16 64GB RAM

DC #2 Standby

1. DB Cluster
   - 12 vCPU 84GB RAM vMEM
   - Agfa would deploy 2x1x16 64GB RAM servers
   - Provides N+1 configuration and initial fail
2. Application Cluster
   - 81vCPU 277GB RAM vMEM
   - Agfa would deploy 4x2x16 128GB RAM servers
   - Provides N+1 configuration

Clinical Sites Proxy 1,2,3,4, 5,6 … If Required

1. Site #1
   - 8vCPU 32GB RAM
2. Site #2
   - 8vCPU 32GB RAM
3. Site #3
   - 8vCPU 32GB RAM
4. Site #4
   - 8vCPU 32GB RAM

- Agfa Would deploy 1x16x64 Server for each site Requiring a proxy

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STRG Storage Recommendation

Project Storage Summary

Storage capacity DC 1 [GB]		
Tier-1	Tier-2	Tier-4
5,808	14,391	0
20,200		

Storage capacity DC 2 [GB]		
Tier-1	Tier-2	Tier-4
4,016	10,830	0
14,846		

Storage capacity Proxy 1 [GB]		
Tier-1	Tier-2	Tier-4
112	2,352	0
2,464		

Storage capacity Proxy 2 [GB]		
Tier-1	Tier-2	Tier-4
112	2,352	0
2,464		

Storage capacity Proxy 3 [GB]		
Tier-1	Tier-2	Tier-4
112	2,352	0
2,464		

Storage capacity Proxy 4 [GB]		
Tier-1	Tier-2	Tier-4
112	2,352	0
2,464		

Details available upon request

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Storage Continued

Tier	General Recommendations for Customer Managed Storage (unknown storage technonlogy)*
Tier 1	**System, Databases, Operating Systems, VMFS** RAID 10: Always on Block IO Recommend 10k to 15k RPM SAS drives Minimum 12 disks for small Database, 24 or more for large DB Recommended latency < 5 mSec. iSCSi not recommended due to potential latency issues Recommended IOPS for this storage tier: ◆ Small Site (150k Annual Studies) Normal 500 to 1k IOPS Peak Operations 2k to 2.5k IOPS ◆ Med Site (250k Annual Studies) Normal 500 to 1k IOPS Peak Operations 3k to 3.5k IOPS ◆ Large Site (1M Annual Studies) Normal 10k to 25k IOPS Peak Operations 30k to 40k IOPS
Tier 2	**Short Term Storage (Image Caches, Database backups**)** RAID 5 (not RAID 6) for Image Caches Recommend 10k RPM SAS drives Block storage OR high performance File Access (dedicated storage vLAN) ◆ Block storage typically used for Small Site Image Caches (e.g. 1 EI App Server) ◆ File Access typically used for Larger Sites (e.g. required for multiple EI App Servers) Recommendations for File Access - Average time per operation < 6 milliseconds - Average time per lookup operation < 100 milliseconds - Single thread random read > 30 MB/Sec Recommended IOPS for this storage tier: ◆ Small Site (150k Annual Studies) Normal 100 to 500 IOPS Peak Operations 300 to 1.5k IOPS ◆ Med Site (250k Annual Studies) Normal 500 to 1k IOPS Peak Operations 1.5k to 3k IOPS ◆ Large Site (1M Annual Studies) Normal 1k to 5k IOPS Peak Operations 3k to 15k IOPS
Tier 4	**Long Term Image Archive** RAID 5 or RAID 6 on either block or file - typically file Archive Tier, larger volume, cost optimized Recommend up to 4 TB drives Recommend 2 archived copies of every imaging study

* More details available for known selection (e.g. EMC, HP, NetApp)

** Recommend an enterprise backup solution to move DB backup files to a secure location

NA For STRG

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STRG Network To Methodist SA

STRG Network Load Calculations		
Studies/ Yr	600,000	(200K Current + 200 K Prior #1 + 200 K Prior #2 = 600K)
MB/Study	80	(conservative)
GB/Yr	48,000	(Units converted to GB)
working days	312	
GB/Work Day	153.85	
6 hours work day	25.64	(Data to move per hour to move entire days data over 6 hour period)
		1 Gb/sec trasfers .1333 min/GB
Min	3.42	Time to move 25.64GB over 1Gb network
Hours	0.06	Total hours required at burst rate
	0.113931624	Total hours required at burst rate including replication to second datacenter
	GOOD TO GO!!	
Assumption - 100% of 1Gb/sec pipe available - does not include overhead and other replication (e.g. VMWare)		
http://www.convert-me.com/en/convert/data_transfer_rate/dgigabitps.html		

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